# The Communicator

November– December 2023

# SARC

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The Bi-monthly Journal of Surrey Amateur Radio Communications

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Issues appear bi-monthly, on odd-numbered months, for area Amateur Radio operators and beyond, to enhance the exchange of information and to promote ham radio activity.

Contributions of articles and photos are welcome.

During non-publication months we encourage you to visit the Digital Communicator at **ve7sar.blogspot.ca**, which includes recent news, past issues of ***The Communicator***, our history, photos, videos and other information.

To subscribe, unsubscribe or change your address for e-mail delivery of this electronic journal, notify **communicator @ ve7sar.net**

If you find ***The Communicator*** worthwhile, regular readers who are not SARC members are invited to contribute a donation towards our Field Day fund via PayPal.

SARC maintains a website at **www.ve7sar.net**

## DEPARTMENTS


The rest of the story **4**

The Orca DX and Contest Club **8**

News you can lose —Ham humour **13**

Radio ramblings **14**

Fuses and the 'crowbar' circuit **28**

Soldering skills and a workshop **35**

A Yaesu FT-857D off-grid portable kit **42**

Antenna adventures **46**

Daniel's workbench **51**

ARDF World Championships—Team Canada **73**

Around the GOTA corner **80**

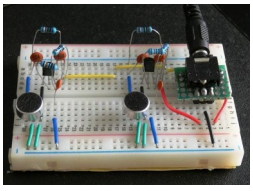
Issue columnists **82 - 96**

Back to basics **98**

SARC & SEPAR news **105 - 128**

QRT **130**


## IN THIS ISSUE



Daniel Romila is back with several projects, a look at the 1.2m band, a mobile radio review, and information on a variety of electronics.

Problems getting 'lift-off' with your antenna launcher? Here is an inexpensive solution from VA7KOT

In this issue Kevin McQuiggin looks at the latest in Gnuradio and knots that may be useful for hams.

...and so much more!

# QRM

*Do you have a photo or bit of Ham news to share? An Interesting link?*

*Something to sell or something you are looking for?*
*eMail it to communicator at ve7sar.net for inclusion in this publication.*

This is the final Communicator for 2023 and another year has flown by for us. This year has been a significant one at Surrey Amateur Radio Communications and the Surrey Emergency Program Amateur Radio, and we have made considerable progress in promoting Amateur Radio within our community. Our efforts have been focused on increasing awareness and participation in the full palette of amateur radio activities, which serve as a vital communication tool, especially during emergencies.

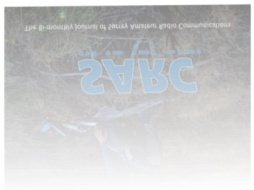
Our 'Get On The Air' (GOTA) program has been instrumental in this endeavor. The GOTA program is designed to promote the experience and the thrill of amateur radio operation. It provides an opportunity for newly-licensed individuals to operate a station with the support of experienced amateur radio operators. This hands-on experience has proven invaluable for many new hams, leading to an increase in club and individual activities.

In addition to promoting amateur radio, we have also worked tirelessly to strengthen our emergency communication capabilities. Our team has been actively involved in various drills and exercises, ensuring that we are prepared to provide reliable communication in times of need.

Overall, our efforts over the past year have not only promoted the hobby of amateur radio but also contributed significantly to our community's safety and resilience. We look forward to continuing our work and making even greater strides in the coming year.

73,

*~ John VE7TI, Editor*
*communicator@ve7sar.net*



## This Month's Cover…

*Dmitry VA7DVO is a relatively new ham who, together with his son Alex VA7PVC, has come through our course and embraced the hobby. They have taken a particular liking to POTA and now combine Amateur Radio with their cycling, hiking and camping activities. Alex is profiled this month in Radio-Active.*

You see, wire telegraphy is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles. Do you understand this? And radio operates exactly the same way: you send signals here, they receive them there. The only difference is that there is no cat.—*Albert Einstein*

## On the Web

**ve7sar.net**

Between Communicators, watch your e-mail for news, announcements of Amateur Radio events, monthly meetings and training opportunities.

Click the links below to follow our presence on the web and social media:

**SARC Blog**
**ve7sar.blogspot.ca**

**Twitter**
**@ve7sar**

**FaceBook**
**SurreyAmateurRadio**

**Our YouTube Channel**
**SurreyARC**

**SARC Photo Albums**
**Web Albums**

**or**

**tinyurl.com/SARCphoto**

# The Rest Of The Story…

## Telegraphy, Radio and TV

Carl August von Steinheil

*Karl August Steinheil, a German physicist and astronomer: b. Rappoltsweiler, Alsace, 12 Oct. 1801; d. Munich, 12 Sept. 1870.*

*After completing a course in law at the University of Erlangen, and courses in astronomy at Göttingen and Königsberg, he was appointed to the chair of physics and mathematics in the University of Munich. He later entered the service of the Austrian government, becoming especially noted for his development and perfection of the telegraph system, a service which he also rendered to the Swiss government a few years later.*

*In 1836 he built the first printing telegraph, invented an electromagnetic telegraph, the electrical clock, a special pyroscope, and brought out the first daguerreotype picture in Germany. He also invented several optical instruments, and in 1854 began the manufacture of optical, astronomical and photographic materials, and it was in his factory that the telescopes for the observatories of Upsala, Mannheim, Leipzig, etc., were made. Steinheilite or iolite, a transparent mineral, was named after him.*

Steinheil began studying law in Erlangen in 1821 and later pursued astronomy in Göttingen and Königsberg. Continuing his studies in astronomy and physics, he lived at his father's estate in Perlachseck near Munich. From 1832 to 1849, Steinheil served as a professor of mathematics and physics at the University of Munich.

Starting in 1820, long-distance electromagnetic telegraph systems employed multiple wires for signal transmission and return currents. In 1836–1837, von Steinheil discovered that the ground could serve as the return path, eliminating the need for a return wire. While Steinheil was not the first to make this discovery, he was unaware of prior experimental work and became the first to apply it to a functioning telegraph, thereby introducing the principle to telegraph engineers. However, issues with this system emerged, particularly with the transcontinental telegraph line constructed in 1861 by the Western Union Company between St. Joseph, Missouri, and Sacramento,

California. During dry weather, the ground connection often developed high resistance, necessitating the pouring of water on the ground rod to enable telegraph operations or phone communication.

In the late nineteenth century, as telephony began to replace telegraphy, it was observed that earth-induced currents from power systems, electric railways, other telephone and telegraph circuits, and natural sources, including lightning, caused unacceptable interference to audio signals. This led to the reintroduction of the two-wire or 'metallic circuit' system around 1883.

In July of 1837, the English celebrated the anniversary of July 25, 1837, when the needle telegraph by Cooke and Wheatstone first became operational on a short section of the Birmingham railway. Around the same time, a more significant invention was unveiled in Germany. Professor Steinheil, ingeniously redesigned the telegraph. His innovation not only rendered wire messages audible through a simple and secure sign language but also enabled their permanent recording.

To form a letter or number, Steinheil chose a maximum of four dots in two lines, allowing for 30 characters in total, as illustrated in the sample *[next page]*. Steinheil established three stations connected by double wire lines running over buildings and his own masts: the academy, the observatory near Bogenhausen, approximately 5 kilometers away, and his apartment in Lerchenstraße. All wire ends converged at the turntable and could be connected as needed to create closed lines.

An authenticated anecdote from the time of Steinheil's early telegraphic experiments exemplifies the profound impression his new invention made. King Ludwig I of Bavaria, known for his receptiveness to innovation, visited Steinheil during heavy foggy weather and inquired about the telegraph's functionality. Steinheil confirmed its operability and allowed the king to communicate with his private residence, where his wife and her sister were present, as

## Steinheil's writing telegraph from 1837

The original apparatus [below], which still exists today, stood in front of the Forum of the Academy of Sciences in Munich. Like Gauss and Weber four years earlier with the Göttingen needle telegraph, Steinheil utilized induced currents generated by a magnetic-electric rotary machine. A 60-pound horseshoe magnet (A) held the anchors at the top. Two induction wire rolls (B), equipped with iron cores, swiftly passed the magnetic poles thanks to the balancer (C) rotating around axis (b). Oppositely directed currents from this process were aligned in the current inverter (D) before reaching the signal generator (E). The latter is depicted more clearly in a horizontal view and consists of a multiplier thread containing two rotatable magnetic rods (c), limited in deflection by plates (e). Both magnets featured small color cups (d) with capillary tips at their ends. A strip of paper (G) was gradually drawn past them using clockwork (H) and the roll (F). Depending on the inductor's rotation direction, one magnet's pole was deflected in the signal generator, followed by the other, thereby rapidly printing upper or lower points on the paper strip. Small magnets (m) positioned alongside the main magnets returned the deflected magnets to their resting position.

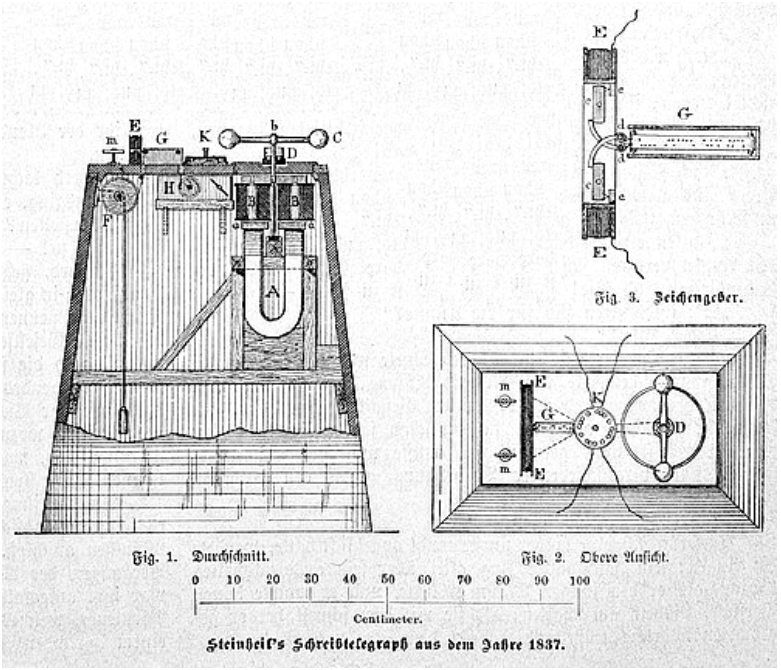
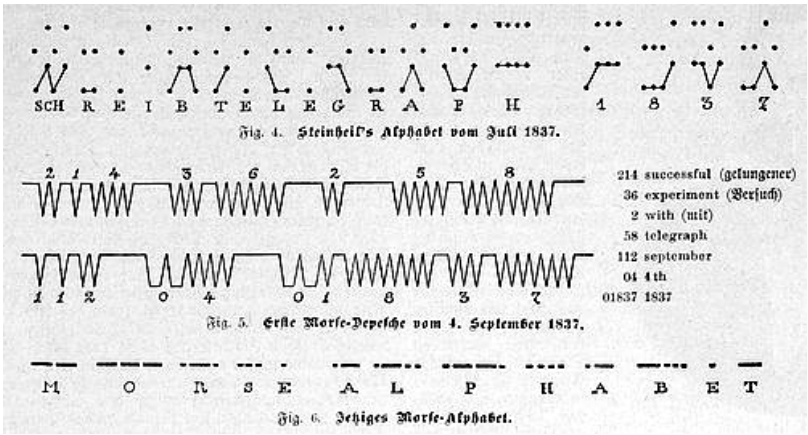


Fig. 3. Zeichengeber.
Fig. 1. Durchschnitt.
Fig. 2. Obere Ansicht.
0 10 20 30 40 50 60 70 80 90 100
Centimeter.
Steinheil's Schreibtelegraph aus dem Jahre 1837.

well as the observatory. King Ludwig, holding Steinheil's alphabet, had the apparatus inquire at the Lerchenstraße station (in German), "What rhymes with fog?" The answer, "lever," appeared letter by letter on the paper strip. The monarch then asked the observatory about the last words he had spoken to Professor Lamont. When the response appeared on the strip from the observatory, King Ludwig paced excitedly before patting Steinheil on the shoulder and remarking, "Be glad you did not live 200 years ago; you would have been burned as a sorcerer!"

In 1838, Steinheil sought further improvement of his telegraph and also invented the galvanic clock, leading to time telegraphy. Gauss had previously suggested the potential use of railway tracks for power lines. To confirm this, Steinheil conducted detailed experiments on the Nuremberg-Fürth railway in June 1838 with government permission. Along the test section, a wire line was strung on rods, with the railway tracks intended to serve as the return path for electric current. Surprisingly, Steinheil discovered that the current passed between the rail tracks through the ground, with the damp soil acting as a conductive medium, akin to a wire with poor conductivity but unlimited thickness. This discovery was pivotal, as it allowed the reduction of wires to a single one, significantly contributing to the construction of long telegraph lines. Steinheil successfully applied this discovery to his Munich telegraph by soldering metal plates to both wire ends and burying them in damp soil, a practice still in use today.


SCH R E I B T E L E G R A P H
1 8 3 7
Fig. 4. Steinheil's Alphabet vom Juli 1837.
2 1 4 3 6 2 5 8
214 successful (gelungener)
36 experiment (Versuch)
2 with (mit)
58 telegraph
112 september
04 4th
01837 1837
1 1 2 0 4 0 1 8 3 7
Fig. 5. Erste Morse-Depesche vom 4. September 1837.
M O R S E A L P H A B E T
Fig. 6. Jetziges Morse-Alphabet.

*Steinheil's alphabet from July 1837*

Although the Steinheil telegraph has faded from memory, the teleprinter, known as the "Morse clerk," is renowned worldwide and operates in state telegraph offices and nearly all railway stations. This recognition does not diminish the outstanding achievements of the American inventor in telegraphy, but a comprehensive review of source literature underscores Steinheil's priority as the inventor of the writing telegraph.

Samuel Morse (born 1791, died 1872), a professor of literature in the drawing arts since 1835, conceived the initial idea for his later telegraph during his return journey from Europe in 1832, inspired by idle experiments with an electromagnet while on a ship. Morse began actively pursuing his idea in 1835, despite limited knowledge of physics and mechanics. He intensified his efforts upon learning of developments in Europe in this field and receiving valuable guidance from his friend, a chemist named Gale. However, until September 1837, none of Gale's work was publicly disclosed, either through the American press or by Morse himself. It was only at the beginning of September that Morse conducted experiments with his pen apparatus, featuring a 185-pound electromagnet, in his New York University room, surrounded by friends and patrons. His first reasonably successful transmission in zigzag script dates back to September 4, 1837. To telegraph numbers, Morse required specially cast circuit types and a telegraphic dictionary for deciphering. The first transmission read, "Successful attempt with telegraph September four 1837."

Illustrations of Morse's early apparatus reveal stark differences from the widespread and finely tuned Morse writers of the time.

The "Recording electric Telegraph" of 1837, in contrast to Steinheil's work, appeared cumbersome, slow, uncomfortable, and largely inoperative, although Morse patented it. Recognizing these shortcomings, Morse fervently focused on perfecting his apparatus with the support of Gale, factory owner Vail, and commerce chief Smith. He modified the telegraph to use an alphabet of dots and dashes, invented the signal generator known as the "button," and improved Wheatstone's relay. The Morse alphabet is now internationally recognized. The writing apparatus, which became operational in 1844 on the Baltimore-Washington test line funded by Morse's state, and subsequently between Hamburg and Cuxhaven in 1848, marked the end of the long-standing optical telegraph.

Notably, Morse did not employ Earth return for electric current until his test line had been operational for half a year. However, some have attributed the discovery of the Earth return line to Morse. Nevertheless, considering that Steinheil had tested his Munich telegraph in July 1837 without external assistance, achieving a fully developed, operational system on a large scale, and acknowledging the economic significance of the discovery of earth's power conductivity, Steinheil must be recognized as the inventor of the writing telegraph, and the true pioneer of electromagnetic telegraphy in general. The first writing telegraph was built on German soil.

## Other accomplishments

In late 1838 or early 1839, Steinheil, alongside Franz von Kobell, used silver chloride and a cardboard camera to create negative photographs of the Frauenkirche and other Munich buildings. They then produced positive images from the negatives, forming the black and white reproductions of the objects. These round photographs had a 4 cm diameter and became known as the "Steinheil method."

Steinheil exhibited several of these photographs in April and Summer 1839. In July 1839, he demonstrated his photography method at Nymphenburg Palace in the presence of Queen Therese.

Steinheil was also among the first in Germany to employ the daguerreotype. By December 1839, he had crafted the world's first portable metal camera, which was nineteen times smaller than Daguerre's camera. At least ten of these cameras were manufactured.

In 1846, Steinheil journeyed to Naples to implement a new system for weight and measure units. Three years later, he joined the Board of Telegraphy of the Austrian Trade Ministry, tasked with designing a telegraph network for the entire empire. He played a pivotal role in establishing the German-Austrian Telegraph Society (Deutsch -Österreichischer Telegraphenverein). In 1851, Steinheil initiated the Swiss telegraph network. He later returned to Munich, serving as konservator (curator) of the mathematical-physical collections and ministerial secretary in the Trade Ministry of Bavaria.

In 1854, Steinheil founded C. A. Steinheil & Söhne, an optical-astronomical company that manufactured telescopes, spectroscopes, and photometers, including one of Steinheil's inventions for measuring brightness. The company supplied large telescopes to observatories in Uppsala, Mannheim, Leipzig, and Utrecht, along with refractors and reflectors featuring silver-coated mirrors developed by Steinheil's friend, Justus Liebig. In 1862, Steinheil's sons assumed management of the company.

Steinheil passed away in Munich, Bavaria, on 14 September 1870, and was interred in the Alter Südfriedhof cemetery.

And that was his story.

~

# September 2023 report

by REBECCA KIMOTO VA7BEC

This is going to be an everything-bagel report. (*You'll understand the catch-all reference if you've read BCQP Report 2023*) Lots of topics to cover.

## Did you know? RAC email aliases changed

Radio Amateurs of Canada (RAC) made changes to the RAC Email Alias / Forwarding System, effective May 15, 2023, whereby the old callsign@rac.ca format was replaced by callsign@myrac.ca. The change was made to address certain security issues. RAC officials and volunteers continue to use their position@rac.ca addresses, but everyone else is on the new system. It was an automatic change, and RAC members didn't have to do anything to continue to receive emails RAC-forwarded emails.

*However, any RAC member using the alias as a safe(r?) option on websites and subscriptions, would have had to update contact details on those sites*. So, if you are a RAC member and used your rac.ca alias for QRZ, ClubLog, contesting forums, online groups, club communications, contest log submissions, your QSL cards -- yeah, all those places you sort of forget about because you don't access/look at them very often -- check your contact details on those sites and update accordingly.

If you are interested in why RAC made the change, visit the Q&A at https://www.rac.ca/cybersecurity/

## Orca DXCC Membership Renewal

It's a little early to be thinking of 2024, but please put Orca DXCC membership renewal on your calendar now so you don't forget. Hosting the PNW DX Convention this year was expensive, even with contributions from attendees, and we need to replenish the coffers.

There are several options: PayPal, cheque/check payable to Orca DX and Contest Club, or Interac email money transfer for anyone in Canada who uses online banking. Go to the membership page of the Orca website for further details. Just $24. The money goes toward club activities/events, including BCQP, donations to DXpeditions that satisfy specific criteria, communication costs and club initiatives as approved by the executive board and, when necessary, membership.

## Contest season is starting!

As you all know, contests come in big and small and, depending your involvement, medium, as well. ;)

With regard to the traveling PNW Challenge Cup, eligible contests are big -- as in weekend marathons -- and the first one is CQ WW RTTY, coming up September 23-24. The other CQ WW events follow in October -- SSB, October 28-29 -- and November -- CW, November 25-26. Applicable ARRL contests -- RTTY Roundup, CW and SSB -- take place in January, February and March, respectively, and the WPX outings are in February, March and May, respectively. IARU in July rounds out the PNW Challenge contests.

The Challenge Cup this year went to the Willamette Valley DX Club -- the run-away winner with a commanding total score of 132,400,629 points -- congratulations! The Western Washington DX Club was second with 66,019,459 points, and Orca DX and Contest Club was just behind them with 65,479,797 points. The Spokane DX Association finished the year-long competition with 16,773,915 points.

Contest participation is strong among all four participating clubs -- more than 280 million points were claimed by hundreds of operators in CW, SSB and RTTY events.

Webmaster Bud VA7ST lists all contest activity, even the small and "medium" events, in Contest Corner on the Orca homepage.

Bud is also minder of the spreadsheet of scores by Orca members in the PNW Challenge contests. The best way to have your score count in Orca's total is to post to 3830ContestScores.com

https://www.3830scores.com/index.php

If you prefer not to post your information to 3830, send Bud an email (bud [at] va7st [dot] ca) with your final claimed score, preferably within a few days after the contest.

When you post to 3830, you can specify your club. That makes Bud's search much easier.

If you are a member of another PNW club as well as Orca, please let Bud know where to allocate your score and in what proportion. This is particularly important if you are part of a multi-op effort. Why? Because PNW Challenge rules state that points can be allocated to any of the PNW clubs that an operator belongs to and in any proportion that person chooses. If you don't let Bud know, he will assume the points go to Orca's tally.

Remember that every point is important. Whether you get on for a few contacts or a full-time, all-weekend effort, please consider submitting your scores so they can be counted in the Orca total. As Bud says, "We may be out there working as single operators, but we're a big team and your participation makes a difference."

## PNW DX Convention 2023 in New Westminster, BC — To boldly go...

The 2023 Pacific Northwest DX Convention, held over the Aug 11–13 weekend, welcomed more than 110 DXers to the Inn at the Quay in New Westminster, BC. Attendees came from near and far, and it was great to see so many people we haven't seen in ages.

The presentations were excellent, with content taking us from technical to touristy. We traveled vicariously from Bouvet to Botswana to Vanuatu and more island destinations, and even into the near (and far) future of artificial intelligence. To boldly go? Indeed, we boldly went. And it was great fun.

A wrap-up of the presentations is not at all like being there in person, where you hear and see and participate—in so

far as an audience can participate—to content, be that a chuckle or a post-presentation question. So yes, while you can probably watch official videos of the DXpeditions highlighted at this year's PNW DX Convention that will give you an idea of the geographical challenges DXpeditioners faced getting to the QTH, setting up, operating, taking down all that went up, and then getting home again, there's more to a DXpedition than pictures alone reveal. An in-person presentation is an opportunity for behind-the-scenes insights, and I'm sure everyone gained a new perspective on many aspects of DXpeditioning, from antennas to packing.

I just don't have sufficient space to list all those pearls of wisdom here. Suffice to say, DXpeditioners do boldly go, often to places that no one else dares. They are intrepid, determined, brave, knowledgeable, organized and able to improvise when the situation calls for flexibility and some MacGyvering. Think extreme cold and blistering heat, pesky critters, sudden downpours, winds that bend verticals to a 90˚ angle or worse, sheer cliffs and rough seas that hinder transfer of people, provisions and equipment to base camp. Even if the DXpedition is to a relatively civilized QTH, there are issues. Think canceled flights or ferries and missed connections, lost luggage, equipment that some official eyes suspiciously and won't release.

Neil VA7DX provided highlights on some of his many DXpeditions. Keith VE7KW offered his expertise on antennas for DXpeditions. Dave VE7VR showcased his safari-style DXpedition to Botswana. Bill KO7SS recounted the truly intrepid DXpedition to Bouvet Island. Al K7AR and Bob W7YAQ took us to Vanuatu.

Ward N0AX presented a past, present and future look at the YASME Foundation. Adrian VE7NZ helped us understand how QTH factors into DXing. And Guy VA7GI ushered us into the world of artificial intelligence.

As with most events, a tremendous amount of work goes on behind the scenes to plan, prepare and execute a PNW DX Convention. So a big thank you to the planning committee, especially Dave VE7VR, and to everyone who made the weekend a wonderful success.

More photos at: https://pacificnwdxconvention.com

## DX activations increasing again

DXpeditioning is back in style. Of course, there was Bouvet 3Y0J and Vanuatu VJ0A, which were showcased at the recent PNW DX Convention, but there were other locations earlier this year, and there will be more coming up. For IOTA hunters, listen for Swains Island W8S and the Federated States of Micronesia (FSM).

FSM will be activated by Cezar VE3LYC, who often goes to remote locations. Check out the IOTA expedition website here: https://v6iota.weebly.com. Cezar's aim is to re-activate the rather rare OC-155 (Pulap Atoll), and put OC-299 (Satawal Atoll) on the air for the first time. Listen for V62P and V62S from Oct 25 - Nov 12.

## BCQP 2023 Wrap-up

After months of log-checking, spreadsheet-making, report-writing, certificate-creating and lots of emailing, I can close the books on BCQP 2023. Just in time to begin promoting BCQP 2024. LOL

Everyone who submitted a log should have received an email from me with links to the post-party report and line scores. If you didn't get the email -- maybe you were on a team and the log-submitter didn't forward the email to the whole team -- you can access the info using the links below.

After-party report with number-crunching analysis: http://orcadxcc.org/content/pdf/bcqp/2023_BCQP_report.pdf

**Full results:**

BC: http://orcadxcc.org/content/pdf/bcqp/2023_BCQP_BC_scores.pdf

Outside BC: http://orcadxcc.org/content/pdf/bcqp/2023_BCQP_outside_BC_scores.pdf

Note that the outside-BC results section in the report is abridged. With more than 300 outside-BC line scores, the report would turn into an epic saga instead of the short novel that it is, so only the data of certificate and plaque winners is listed in the report. See the full results link for all line scores.

**Fast Facts**

- 141 BC operators on the air, up 12 year on year
- 120 BC stations on the air, up 15 year on year
- Logs received: 363, up 22 year on year (51 BC, up 9; 312 outside-BC, up 13)
- CW (CW-only or CW in mixed mode entries) the popular mode again
- Five BC scores exceeded 1-million mark, of which three were above 2 million
- New single-op BC record: 2,757,020 (by VA7RR)
- New high score in Canada (outside BC): 31,202 (by VE3WG)
- New high score CW: 532,740 (by VA7GI)
- Highest CW count ever (aggregate, valid Qs): 14,365
- Highest SSB count ever (aggregate, valid Qs): 11,527
- Highest coverage ratio ever: 92.9% (39 out of 42 districts)

**Quick facts from an Orca perspective**

- 37 Orca members on the air, single-op and in teams
- Orca members captured (or were on teams that captured) 7 out of 10 plaques: Top BC single-op (VA7RR), Top BC multi-op ( VE7JH, VE7UF, VE7XFA and VE7ZO on Team VE7UF), Top YL (VA7TU), Top CW (VA7GI), Top Mixed Mode (VE7ACN), Federal Electoral Districts Contacted (VA7EU) and Top Club (Orca DXCC)
- 6 top BC scores in categories of entry: Team VE7UF (MOHP MIXED), VA7USD (SO QRP PH), VA7GI (SOHP CW), VA7RR (SOHP MIXED), VA7TU (SOHP PH), VE7CV (SOLP MIXED)
- 15 top district scores: Team VE7UF (NPR), VA7FC (SGI), VA7GI (VAC), VA7ST (KEL), VA7RR (CPC), VE7VR (BUS), VE7ACN (CHP), VA7RPE (RIC), VA7QCE (STR), VA7EU (BNS), VA7KBM (VAG) VE7CV (KTC), VE7ZO (COA), VA7TU (SWR), VA7HC (VIC)
- 2 top in state/province outside BC: N7RO (SOLP MIXED in WA), VY1KX (SOLP MIXED in YT)
- Record-smashing score (2,757,020) by Gary VA7RR (SOHP MIXED).
- In-club draw: 38 members qualified for the in-club draw. Callsigns were drawn at a RiverHouse lunch.

Note: All club members on the roster as of February 2023, including those on multi-op teams, who submitted a log of at least 25 Qs were entered into the draw. Three callsigns were drawn: Gary VA7RR, Guy VA7GI and Neil VA7DX.

It goes without saying -- but I'll say it anyway -- Orca members are truly the life of this party. You kept the profile high, and your fine operating skills drew a considerable number of compliments from participants near and far. Well done everyone!

There was a lunch at The RiverHouse back in... well, it was before the PNW DX Convention. We'll probably have another lunch soon. Stay tuned.

And that's it for now. Stay well. QRT de VA7BEC

~ *va7bec[at]gmail[dot]com*

# Page 12

# News You Can't Lose

## Vertical Freedom

Broadcast Tower Climbers in New Documentary

If you have one, do you climb your own tower? Have you ever wondered what it is like to work on top of a cellular or broadcast tower? How do these workers cope with the heights, the risks, and the challenges of their job? What motivates them to pursue this career?

A new documentary titled "Vertical Freedom" aims to answer these questions and more. The film is produced by NATE, the National Association of Tower Erectors, in collaboration with Storybuilt Media, a creative agency that specializes in storytelling.

The documentary features six communications infrastructure workers from different parts of the United States. They share their personal and professional stories, revealing their passion, dedication, and courage. They also show the viewers the technical aspects of their work, such as installing antennas, cables, and equipment on towers that can reach over 1,000 feet high.

One of the climbers featured in the film is Ky Nguyen, who works with RIO Steel and Tower in Texas. He started as a climber 10 years ago with no experience and worked his way up to become a foreman and a project manager. He says he loves his job because it gives him a sense of accomplishment and freedom.

The film also highlights the importance of tower climbers for our society. They are responsible for maintaining and upgrading the communications infrastructure that we rely on every day, especially during emergencies. They are also part of a growing industry that offers many opportunities for career development and advancement.

"Vertical Freedom" is a captivating and inspiring film that showcases the lives and work of tower climbers. It gives us a glimpse into a world that is often overlooked and underappreciated. The film is available to watch on AppleTV, online on NATE's website or on YouTube.

The Vertical Freedom trailer: https://youtu.be/mHUsBrRq28w

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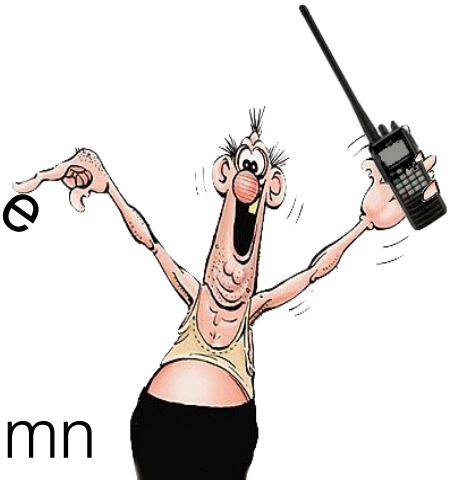
# Page 13—News You Can Lose



The Lighter Side of Amateur Radio

## Aunt Millie Watt's advice column

### The UV5R… A useless radio?

*Aunt Millie: I got a Baofeng UV5R for my husband. How did I do? Thanks, Betrothed in Burnaby.*

Dear Betrothed in Burnaby,

Oh, you've just embarked on a questionable adventure! Getting a Baofeng UV5R for your husband? Well, let me tell you how that played out for my friend.

It all started with a seemingly brilliant idea. You see, her husband, Mike, always complained that he needed better communication when he went off on weekend hiking trips with his friends. He'd return with stories of getting lost in the woods, and she'd think, "What if I could be his lifeline in the wilderness?" So, she did some research and decided to gift him a low-cost Baofeng UV5R.

She ordered it online, excitedly anticipating his reaction. When the package arrived, She wrapped it up with a fancy bow and presented it to him with a flourish. His eyes widened with curiosity as he tore the wrapping paper apart, revealing the radio.

"Ta-da! It's your very own Baofeng UV5R!" she said, beaming with pride. He looked at it for a moment, and then his brow furrowed. "Is this a joke, you know I'm an iCom mobile guy? Why dd you get me a kid's walkie-talkie?"

My friend chuckled nervously. "No, no, it's not just a walkie-talkie. It's a Baofeng UV5R, advertised as the ultimate wilderness communication tool!" He examined it skeptically. "It looks like something a ten-year-old would use for hide-and-seek."

She tried to explain its features, how it could reach long distances, and how he could program it to access emergency frequencies in the bush. But he just sighed and muttered something about her always giving him useless gifts.

A few weeks later, Mike and his friends embarked on one of their hiking adventures. Unable to power his iCom mobile on a hike, he decided to humor her and take the Baofeng UV5R along, thinking he could use the built-in siren if they came across a bear.

On the first day of the trip, his group got separated while exploring a dense forest. They had no cell reception, and panic started to set in. That's when Mike remembered the Baofeng UV5R tucked away in his backpack. He pulled it out, switched it on, and started calling for help. Miraculously, one of his friends still had his own Baofeng (apparently, it had become a trend among hikers in his group). They established contact, and Mike's friend guided him back to the main trail. They rejoined the rest of the group, and everyone was safe and sound.

When he returned home, Mike couldn't stop talking about how the "silly walkie-talkie" had saved the day. He even started referring to it as his "lifesaver radio."

So, dear Betrothed in Burnaby, you might have received a puzzled look initially, but when the time comes, your husband will appreciate that Baofeng UV5R more than you can imagine. Who knew that a seemingly useless gift could turn into a life-saving hero? When he leaves, just remember to say "73 and 88!" (that's ham radio lingo for "best regards, love and kisses") and you'll be good to go.

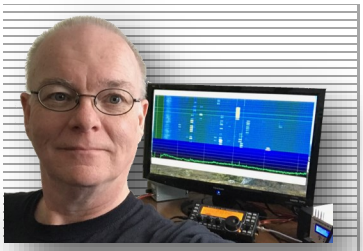
~ *Millie Watt*

# Radio Ramblings

## The Gnuradio Conference

### A digital radio update and a knotty problem solver

by KEVIN McQUIGGIN VE7ZD / KN7Q



**Kevin VE7ZD/KN7Q** is active in EME, meteor scatter and much more. He lives on Vancouver Island

The holiday season is almost upon us. I hope that 2023 has been a good year for you, especially in your amateur radio activities. All the best for this last issue of Radio Ramblings for 2023.

This issue I'd like to report on the annual gnuradio conference GRCon23, which was held in Tempe, Arizona this past September. I'll also talk a bit about innovation, and we'll finish up with some "knotty bits" and a website that may be of assistance to you when you're working to deploy your latest antenna creation.

#### Gnuradio Conference 2023

You have probably heard of gnuradio. It is an open source application which runs on Windows, MacOS and Linux that allows you to use a simple graphical user interface to design radio receivers and transmitters of all types, from basic AM/FM/SSB receivers and transmitters to software-defined satellite receivers, digital TV systems or even personal cellular telephone sites. See https://gnuradio.org. Figure 1 shows an example gnuradio flowgraph.

I've written about gnuradio in this column several times before, and I would highly recommend download and experimentation with the free package for any of us who want to learn more about digital signal processing, SDRs (software-defined radios) and digital radio technology through experimentation [18].

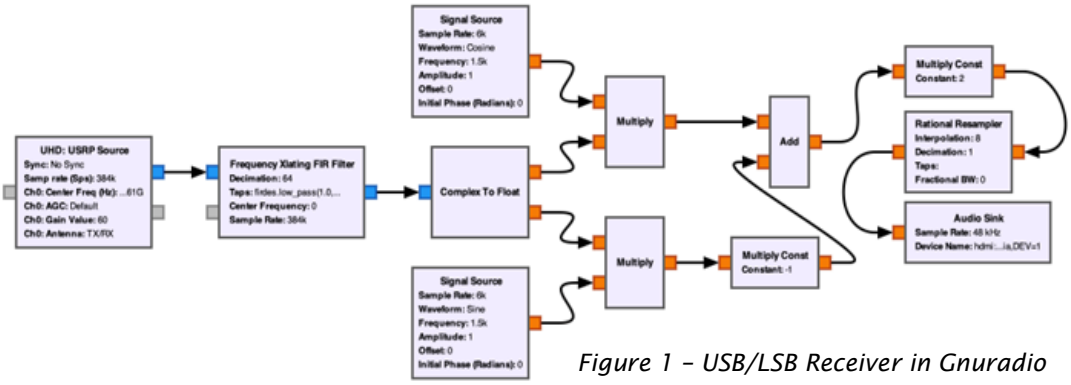



*Figure 1 – USB/LSB Receiver in Gnuradio*

GRCon23
TEMPE, ARIZONA

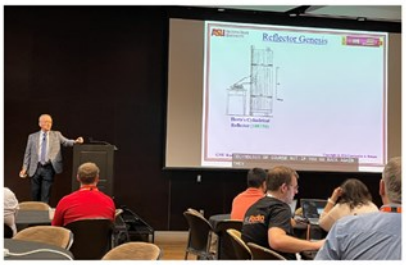


*Figure 2 – GRCon23 in Tempe, AZ*

Gnuradio has a bit of a learning curve, but if you are willing to "climb the hill" and persevere while you do so then you can do many great (and fun) things with the application.

Once your new SDR works you will have learned a lot, plus you'll have bragging rights with other hams – you will be able to factually state that "I designed and built this radio myself".

Gnuradio holds an annual conference called "GRCon" where developers, users and scientists come together to present their work using the application during the past year, share ideas, and chart the future for the open source project. This year's conference was on the campus of Arizona State University (ASU) in Tempe, Arizona [1].

This was the fourth time that I have attended GRCon. There were about 300 attendees and they hailed from many nations and many walks of life. There were several attendees from academia, plus a strong representation from industry, students from computing science and engineering programs, and a number of attendees from government and non-profit organizations.

FAIR — Facility for Antiproton and Ion Research in Europe

*Figure 3 – FAIR in Darmstadt, Germany [11]*

The field of subatomic physics was well represented and there were several attendees from FAIR (Facility for Anti-Proton and Ion Research) in Darmstadt, Germany. FAIR started in 2017. It calls itself "The Universe in the Lab" and will host one of the largest particle accelerators in the world once construction is completed in a few years. "At FAIR, matter that usually only exists in the depth of space will be produced in a lab for research" [11].

FAIR uses gnuradio to measure their particle beams and control key aspects of one of the world's largest particle accelerators. Many of the scientists (and notably the senior scientist Dr. Ralph Steinhagen) are hams, and Ralph in particular credited his youthful experimentation with amateur radio as a big factor in his decision to pursue a career in physics.

Also presenting was a scientist and radio astronomer from Leiden University in the Netherlands, Paul Boven PE1NUT (nice call!). Paul works primarily in the field of very long baseline interferometry (VLBI). He also volunteers with an amateur radio group that conducts radio astronomy experiments and occasional EME (moonbounce) activity using the 25 metre Dwingeloo radio telescope [12]. See Figure 4.

Paul gave a very interesting talk about the criticality of accurate time measurements when trying to electronically link radio telescopes situated dozens or even thousands of kilometres apart so that their signals can be combined using VLBI to improve signal resolution and detect weaker aspects of a target radio signal.

Another presentation by Prof. Lindy Elkins-Tanton of ASU, the Principal Investigator for the "Psyche" mission at the Jet Propulsion Laboratory (JPL), described the forthcoming space probe mission to a metal-based asteroid [2] in some detail. She described the mission's science objectives, the design process for the spacecraft, the arduous testing and revisions that any multimillion-dollar space probe must undergo to be certified for flight, and (very interestingly) the human factors that support success (or that contribute to failure) in these complex technology projects.

*Figure 4 – The Dwingeloo Radio Telescope [12]*

*Figure 5 – NASA's Psyche Mission [19]*

The Psyche project suffered a setback because of a missed key deadline (partially due to COVID-19) that almost resulted in cancellation of the mission. However, through dedication and redoubled effort on the part of the entire project team, Psyche managed to regain its feet. Like making lemonade from a bunch a lemons, the setback generated valuable project management information for ASU, NASA and JPL that will be used to improve future projects.

Four weeks after GRCon the Psyche probe was successfully launched and is now enroute to its encounter with its namesake, a metallic asteroid orbiting the sun between Mars and Jupiter that will hopefully provide humanity with new information about the birth of our solar system [19].

Some gnuradio users such as Daniel Estevez EA4GPZ/M0HXM [17] have put together SDR receivers that can receive the probe's transmissions at about 8.4 GHz and are now monitoring its progress. See Figure 6. Psyche will reach its target asteroid in about six years [3].

On Tuesday, there was a very interesting presentation by Dr. Wael Farah of the SETI Institute [4] about the Allen Telescope Array in northern California. Figure 7 shows the telescope with its purposefully randomly-placed parabolic antennas. This large multi-telescope radio observatory was supported by Paul Allen (co-founder of Microsoft) before

*Figure 7 – The Allen Telescope Array, Shasta County, CA.*

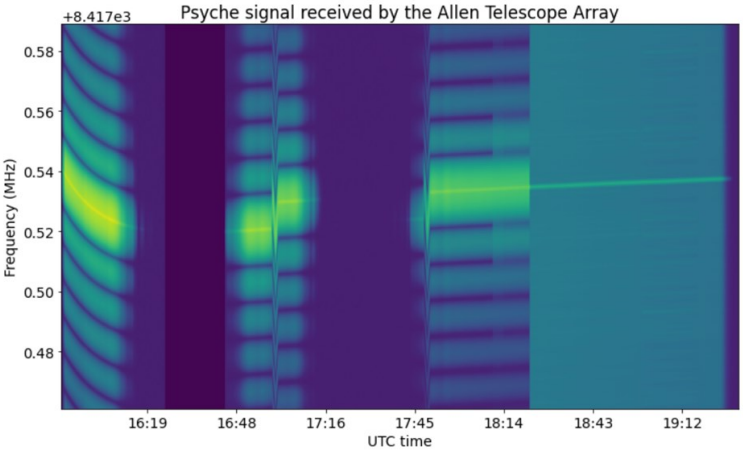



*Figure 6 – Amateur Reception of the Psyche Space Probe [13]*

his death in 2018 [20]. The array leverages gnuradio for its various classes of observations, which include astronomical research as well as a simultaneous search for extraterrestrial intelligence (SETI) [5].

A presentation by Dr. Simon Steel, Deputy Director of the SETI Institute's Carl Sagan Center reviewed recent research into methods for potential detection of extraterrestrial life. With deployment of new spacecraft such as the James Webb space telescope and improvements in analytical technology, it may be possible to detect life on other planets through methods other than reception of radio signals, such as through analysis of an exoplanet's atmosphere using spectral imaging. This talk was fascinating and showed how SETI has evolved from a fringe research activity to one that is accepted and supported by the serious scientific community.

The SETI Institute runs gnuradio as both an observational and an analytical tool, and in fact is a key sponsor and contributor to the gnuradio project.

Amateur radio is well represented in the gnuradio community. Dozens of the GRCon attendees were hams and attendees proudly displayed their callsigns on the conference name badges. During breaks and at the evening socials which always accompany

conferences of this type many of the amateurs got together to discuss their amateur radio interests. It was interesting to me that (I would estimate) probably two thirds of the hams at the conference credited amateur radio for leading them towards their professional careers.

On the third day of the conference, I presented on “Amateur Radio, DSP and GNU Radio” and spoke for an hour about how gnuradio could serve to improve amateur radio training both for those seeking their first certification or license, but also for those already certified or licensed who want to improve their understanding of SDRs and DSP and better keep abreast of modern radio technology.

My point in the talk was to say that for amateur radio to continue to innovate and remain relevant to industry and government, that amateur certification/licensing standards need to be updated to reflect these new technologies.

Amateur radio certification in almost all nations remains focused on historical analog technologies that have been superseded by digital techniques in just about every respect. If amateur radio is to remain relevant and of use to government (disaster mitigation, emergency communications and societal support) and to academia/industry (as a source of pre-qualified students with basic electronic and technological skills), then the certification/licensing standards need to change to reflect these new technologies. Without these changes amateur radio will fall further and further behind the technological curve and lose the ability to contribute to positive technological change.

The audience clearly understood the strong innovative history that amateur radio has, and through a few questions during the talk and in discussions afterwards I felt that the attendees were supportive of my statement of the issues. Everyone knew the value of amateur radio and could also see that without modernization the hobby would lose ground relative to the state of the art. Industry and post-secondary education programs such as electrical/electronic engineering value amateur radio experience for their incoming staff and students because it better prepares them for their work or school assignments.

Modernization of amateur radio licensing/certification remains with federal governments (because they set the standards and control the examinations) in accordance with ITU (International Telecommunication Union) standards [21], but amateur radio associations can certainly influence government in this regard. I hope that these discussions will take place.

As is usual at each GRCon, a local amateur radio Volunteer Examination Coordinator (VEC) team agreed to come to the conference and invigilate ham exams for those attendees who seek to obtain their FCC amateur radio tickets. The VEC process is quite well managed [14], and anyone (even non-US residents) can write the FCC exams and get a US callsign. I wrote the exams and earned my FCC license at GRCon in 2018.

The VEC team was composed of veteran hams from the Phoenix area, and I had a chance to speak with them both before and during their examination session. The gnuradio group covers the cost of the exam, and about three dozen conference attendees “took the plunge” and wrote their FCC exams. US rules say that non-licensed individuals must write the “Technician” exam to become Technician class operators. If the candidate passes, then he can choose to write the next exam for the “General” license. Those who pass “General” can choose to write the “Extra” exam.

It's important to note that amateurs in Canada are “certified”, while US hams are “licensed”. American regulations use different terminology than we do.

Canada doesn’t have an examination equivalent to “Technician”, but the US “General” license is pretty much equivalent to our “Basic” certification. An American “Extra” exam is slightly more advanced than a Canadian “Advanced” examination [6].

The biggest difference between Canadian and American examinations, however, is in the area of rules and regulations. These are close, but the small differences (for example, US "General" hams cannot operate voice modes between 14.150 and 14.225 MHz, while such usage is legal in Canada) will catch you. The devil is in the details, so you need to "study up" a bit. In the technical aspects the exams are very similar in scope.

The weather in Tempe was impressive: clear skies 24 hours a day and temperature over 38 degrees C every morning. Daytime temperatures rose to 110 to 115 degrees Fahrenheit (43 to 46 degrees C). The daytime temperature had not dropped below 100 degrees F in over one hundred days. It was incredibly hot, but as the saying goes, it didn't seem that overwhelming because it's a "dry heat". I had never put much creed in that statement, but the low humidity (around 5 - 10 percent) did seem to make a difference.

Food was excellent both at the university and after hours at local restaurants. Tempe is largely a university town so there were lots of restaurants to choose from.

There was a conference sponsors' exhibit hall associated with GRCon, and it ran daily during the conference. Most of the sponsors were SDR and DSP equipment vendors, but there were some associations and academic institutions also in attendance. I'd like to focus on one of these groups, called "Amateur Radio Digital Communications" in the next section.

## ARDC

ARDC stands for "Amateur Radio Digital Communications" and it is a non-profit foundation that was formed in support of amateur radio innovation. See https://ardc.net for details. ARDC's mission is shown in Figure 8.

This is certainly a noble objective. ARDC is a funded entity whose financial position has been funded by the sale of 4.2 million IP addresses from the 44.0.0.0 IP address space.

*Figure 8 – ARDC Logo*

*"... support, promote, and enhance digital communication and broader communication science and technology, to promote amateur radio, scientific research, experimentation, education, development, open access, and innovation in information and communication technology."*

What? This needs some explanation! In the early days of the Internet, a forward-thinking amateur named Hank Magnuski, KA6M arranged for the reservation of the IP subnet beginning with the octet 44 for the use of amateur radio. This subnet contains about 16.8 million IP addresses (numbered 44.0.0.0 through 44.255.255.255) [15].

KA6M believed that the Internet would grow in popularity, and that a day would come when amateur radio operators worldwide would want to place their home computers, radios, and other devices on the net. Every amateur would have one or more 44.x.x.x IP addresses. Ensuring that all amateurs were part of "44 net" would support internetworking by amateurs, for purposes that he could not fully imagine at the time. It just seemed like a good idea, so he applied for and was granted the entire 44.0.0.0 subnet for the use of amateur radio.

Fast forward 25 years: amateur radio and the Internet have evolved significantly, but not exactly in the way that Hank had expected. Hams have lots of computers, radios and other devices that need to be networked, but home routers, NAT (network address translation) and non-routable subnets (think of your IP addresses at home that begin with 10.x.x.x or 192.168.x.x) have eliminated the need for every device to have its own routable IP address [7].

Think of your own situation – you probably have lots of devices "behind" your home router. Linkage of all these devices to the net is performed by your router: all the devices have 192.168.x.x or 10.x.x.x addresses on your home network, and your router sorts out which messages from the Internet go to which of your devices. You don't need a "routable" address for every device you have at home.

The result is that the full set of 16.8 million routable IP addresses in "44 net" is far too big. Hams will never need that many IP addresses.

New IP addresses are scarce, and organizations will pay a lot of money for access to new IP address space. ARDC saw an opportunity in this.

The foundation assessed potential future amateur radio IP address requirements and decided to auction off one quarter (about 4.2 million) of these "44 net" addresses to companies and agencies seeking their own address space. Funds from this sale went into an endowment that ARDC now uses to offer grants to individuals and vetted agencies who are working on innovative projects that will likely have a positive impact on amateur radio. ARDC focuses on digital radio and applications that will help drive amateur radio forward.

At the conference I met Jon Kemper, KA6NVY who is the Technical Director of the organization. Jon attends major amateur radio events and radio-related industry conferences such as GRCon in order to meet amateurs, researchers, educators and innovators and to seek out interesting new ideas and/or projects that may benefit from ARDC funding.

We had a good discussion about the current state of amateur radio and the huge potential that the hobby has for future innovation, as well as the evolution of digital technology and the significant impact that SDRs and DSP will have on future telecommunication systems, and on amateur radio.

An example of a recent project that has received ARDC funding is the "FreeDV" digital voice project (see https://freedv.org) that I discussed in some detail in the May/June 2023 issue of The Communicator [9].

I believe that ARDC is doing incredibly important work, and that the grants they are funding will probably play an important role in the way that amateur radio develops in the remainder of the 21st century.

As the philosopher Thomas Kuhn wrote in his ground-breaking book "The Structure of Scientific Revolutions" (1962, University of Chicago, see [16]), history shows that new theories or profoundly superior new technologies can generate significant push-back from "experts" and others who are comfortable with the status quo and feel threatened by new ideas. Sometimes expert resistance is strong enough to quash new ideas, but eventually the better idea or more correct theory prevails [7].

Examples of this include Copernicus' proposal (originating from the early 1500s but not published until just before his death in 1543) that the Sun, rather than the Earth, is the centre of the universe (heliocentric theory) [22]. This idea greatly upset both the scientists of the day, and the Roman Catholic church, who believed that the Earth was the centre of all creation. The experts responded

strongly. The Italian philosopher Giordano Bruno, a promoter of heliocentrism was excommunicated by the Pope, declared a heretic, and burned alive at the stake in 1600.

A more recent example would be the theory of the "aether", a mysterious substance which, up until the late 1800s, was believed to have to exist in order to support the transmission of light and radio waves. It was accepted by all scientists that light and radio signals could not travel through space without a medium to support them. Several experiments to detect the aether were unsuccessful. The mechanism of transmission of electromagnetic waves without aether, i.e. in a vacuum, was finally explained in 1905 by Albert Einstein. Fortunately, no scientists were executed before the theory of the aether was relegated to the dumpster.

Groups like ARDC look for revolutionary new ideas because they value creativity and innovation and see a bright future for the amateur radio service. What a great way to support technological development!

## The "Knotty Bits"

As long-married couples do, Laura VE7LPM and I were out for coffee and seated at a table in the local coffee shop, *venti* coffees by our side. She was on her laptop, and I on mine, and we were messaging each other across the table about the interesting stories we were reading or sites that we were visiting on the web. That's what couples do, isn't it? Real communication :-/

I was about ten links deep into a document describing a new microprocessor that has integrated WiFi and Bluetooth, while Laura was following her own web-based pursuits.

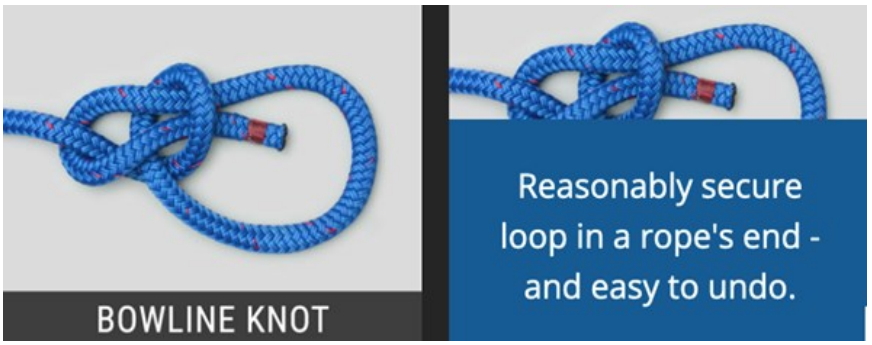
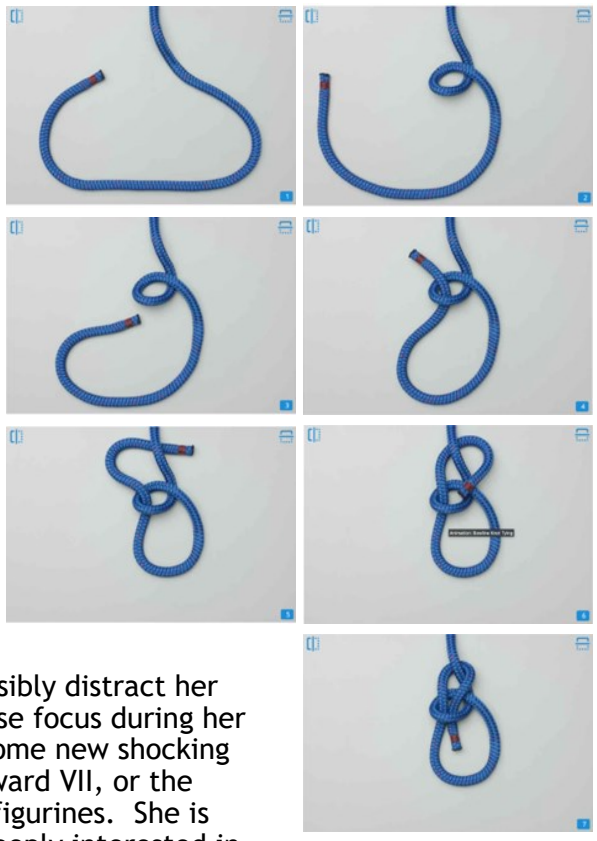



*Figure 9 – Menu Description - Bowline*

*Figure 10 – Screenshots from the Bowline's Stop-Action Video*



Excited by my reading, I thought of messaging her in regard to the novel way in which the new processor handles stacked interrupts. It was fascinating. But then I had second thoughts: I did not want to excite her too much. I *know* that she loves this type of technical documentation as much as I do…

Worse, it could possibly distract her and cause her to lose focus during her quest to discover some new shocking fact about King Edward VII, or the history of Paragon figurines. She is certain that I am deeply interested in these subjects as well…

Then Laura broke the silence. "Look at this knotty web site", she said. "It would be really helpful to you and other SARC hams to know about this. I'll send you the link".

Naughty site? Sounds intriguing, I thought, but this type of surfing was quite out of character for my significant other. Why would such a site be of interest to others in SARC? My mind raced as I waited for the email.

The link arrived. I inspected the site and had found that I had to agree with my XYL. The site really would be of value to everyone in SARC!

### Here's what she found.

There's an excellent website called "Animated Knots" that documents all sorts of knots that are of use to radio amateurs. We've probably (mostly) forgotten the verbal descriptions of various knots that we learned as kids using mnemonic phrases like "the fox comes out of his hole, goes around the tree and back down into his hole" [10].

### Animated Knots

(https://www.animatedknots.com/) provides information on how to tie hundreds of useful knots. What is unique is that the site provides a time-stop video for every knot that clearly shows the steps involved in tying it.

The knots are divided into classes according to usage and type. For example, if you need a good knot to securely fasten two ropes of different size together, then the site will give you several choices, with a video for how to tie each of the knots. See Figure 9 for the high-level description of the bowline, and Figure 10 for a set of screenshots from the stop-action video that shows how the bowline is tied.

The applicability of this information for amateur radio is broad: knots are critical as supports for wire antennas, for guy lines, as hitches for raising tower sections or antenna booms and for many other purposes.

In my case, I will be able to use the site to find better knots for joining ropes together, and for securing my dipoles in the trees here at the new QTH on Vancouver Island.

### Conclusion

That's it for this issue. I hope that you and your family/friends have a great holiday season. It'd be a nice time to delve into gnuradio, think of a creative new amateur radio project, or put up a new wire antenna and secure it using a specialty knot that won't slip in the ice and snow of December. Have fun and stay curious! See you in 2024!

Feedback, including questions on this article can be directed to the Editor, or directly to me at mcquiggi@sfu.ca. Thanks for reading!

73,

*~ Kevin VE7ZD / KN7Q*

### *Social Reminder*

The Saturday weekly social gathering is once again 'on' at the Denny's Restaurant, 6850 King George Blvd., Surrey BC from 07:00—09:00. All are invited. Afterwards, we will host workshops and will be available to invigilate Amateur Radio exams at the OTC, 5756—142 Street, Surrey from 10-noon.

Bring your ham issues, our Elmers will try to help you sort them out.

**References:**


[1] Conference website and list of talks at https://events.gnuradio.org/event/21/.

[2] https://en.wikipedia.org/wiki/Psyche_(spacecraft)

[3] https://www.jpl.nasa.gov/missions/psyche

[4] https://www.seti.org/

[5] Allen telescope link is https://en.wikipedia.org/wiki/Allen_Telescope_Array

[6] With some study and (in particular) a thorough review of US FCC radio regulations, a Canadian Basic ham can likely pass a US General exam with little trouble. Similarly, an Advanced Canadian ham could with a bit of additional study likely pass the US Extra exam. You'd get a new call that you can use while you are in the US or abroad!

Note that if you have both a Canadian certification and a US (or other nation's) amateur license that under Canadian regulations you must use your Canadian call when you are in Canada. For example, I hold the US Extra callsign KN7Q, but I cannot use that in Canada - I must use VE7ZD! The rule is similar in the US: I hold KN7Q, so while in the USA I must use that call and cannot legally use VE7ZD.

[7] IP Version 6 (IPV6) is another factor: each IPV6 address contains 128 bits, compared to the former IP address standard of 32 bits. IPV6 can support 3.4 times 10^38 unique addresses. 340 "undecillion", according to https://www.wolframalpha.com/input/?i=2%5E128.

[8] The book is discussed at https://en.wikipedia.org/wiki/The_Structure_of_Scientific_Revolutions

[9] See https://archive.org/details/sarc-communicator-2023-05/23%20May-Jun%20SARC%20Communicator?q=freedv.

[10] Verbal description of the bowline knot. See the description of scouting knots on https://www.mnemonic-device.com.

[11] Information about FAIR is available at https://fair-center.eu/overview.

[12] The Dwingeloo radio telescope dates from 1954. See https://en.wikipedia.org/wiki/Dwingeloo_Radio_Observatory

[13] See https://destevez.net/2023/10/receiving-the-psyche-launch/. Dr. Daniel Estevez is a ham, a satellite communications hobbyist and creator of a free gnuradio package called gr-satellites that any gnuradio user can use to decode telemetry from dozens of amateur and commercial spacecraft. See the gnuradio site at https://gnuradio.org for more information or just google "gnuradio gr-satellites".

[14] The ARRL manages the VEC program. See https://www.arrl.org/volunteer-examiners.

[15] The number 16.8 million comes from the fact that IP addresses have four 8-bit values in them. The three bytes x, y, and z (or octets) after 44.x.y.z each have 256 possibilities (each octet is 8 bits long, and 8 bits can hold an integer between 0 and 255, for 256 distinct values. 256 x 256 x 256 equals 16,777,216 or about 16.8 million addresses in "44 net".

[16] See https://www.amazon.com/Structure-Scientific-Revolutions-Thomas-Kuhn/dp/0226458040.

[17] Daniel is very active in gnuradio and has a web page on reception of Psyche and many other satellites and space probes at https://destevez.net/.

[18] Gnuradio has a new and much improved installation facility called "RadioConda" that makes installation of the package much easier than before. See the project site at https://github.com/ryanvolz/radioconda. RadioConda includes a number of useful gnuradio applications such as GQRX (an all mode receiver). For hardware, a C$40 USB RTL dongle such as those available from NooElec at https://www.nooelec.com/store/sdr/sdr-receivers/nesdr.html will work just fine.

[19] See https://www.jpl.nasa.gov/missions/psyche

[20] A biography of Paul Allen including his sponsorship of the Allen Telescope is at https://en.wikipedia.org/wiki/Paul_Allen.

[21] As a specialized agency of the United Nations, the ITU sets international radio standards that national governments across the globe agree to comply with. Training standards for amateur radio are broadly specified and although the specifics of training vary from nation to nation, federal governments often work together to define common standards. We see this in, for example, the general compatibility of amateur radio training standards between Canada and the USA. Governments can work together to develop new training standards and can then bring proposals for modernization to the ITU through periodic World Radio Conferences.

[22] Of course, the Sun is the centre of our solar system, not the centre of the universe, but Copernicus' theory postulated the latter as he was not aware of the vast scale of the cosmos!

# SARC's next project

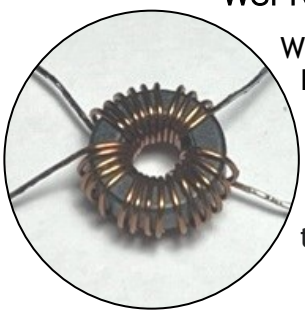
## An update on unlocking the world with WSPR: The 5W Beacon Project

A collaboration between French and Canadian Amateur Radio enthusiast and SARC

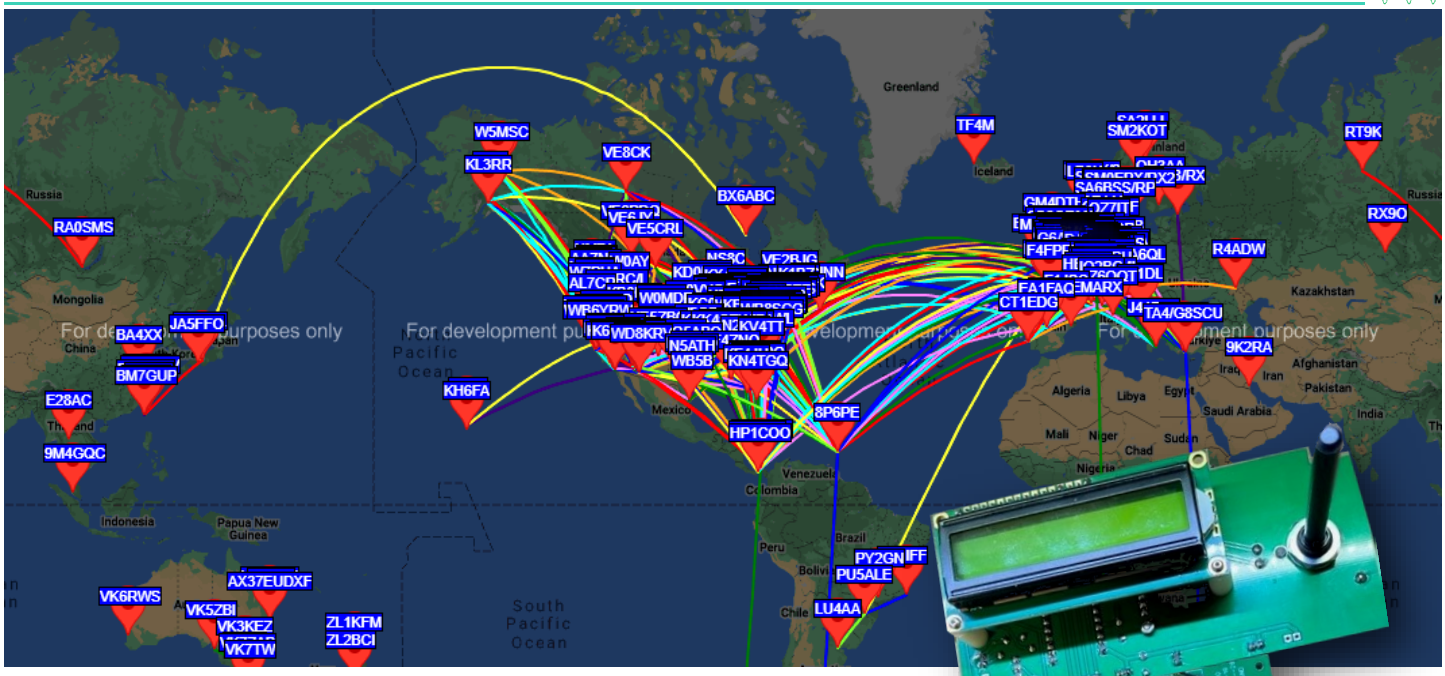
The test builds of Pierre F6IDT's WSPR beacon described in the last issue of The Communicator continue. Three kits are currently being assembled as parts are received… a slow process these days.

We are at the trickiest step… hand winding the coils, as shown in the photos. They have to be tested on the analyzer and tweaked by closing or separating the windings. This is a precise and slow process. When the three test kits are built, tested, and a manual written, we will move on to the SARC club project.

### WSPR



Why WSPR? (pronounced "whisper") It is an acronym for Weak Signal Propagation Reporter. It is a protocol, implemented in a computer program, used for weak-signal radio communication between amateur radio operators. The protocol was designed, and a program written initially, by Joe Taylor, K1JT. The software code is now open source and is developed by a small team. The program is designed for sending and receiving low-power transmissions to test propagation paths on the MF and HF bands.




WSPR implements a protocol designed for probing potential propagation paths with low-power transmissions. Transmissions carry a station's callsign, Maidenhead grid locator, and transmitter power in dBm. The program can decode signals with a signal-to-noise ratio as low as −28 dB in a 2500 Hz bandwidth. Stations with internet access can automatically upload their reception reports to a central database called WSPRnet, which includes a mapping facility.

The information can then be displayed on a world map that shows where around the globe your signal is being heard. With that knowledge you can work the area on the band that shows weak signal propagation.

**The current stage—winding inductors**

The WSPR beacon project has a number of inductors, each of which have to be hand wound to the appropriate frequency. The wire used for winding should be chosen based on the current it needs to carry and the space available on the core.

Ferrite cores are a used due to their high magnetic permeability. In this case we are using 'toroidal' cores, small circular 'donut' shaped. The advantage of the toroidal shape is that, due to its symmetry, the amount of magnetic flux that escapes outside the core (leakage flux) can be made low, potentially making it more efficient and making it emit less electromagnetic interference (EMI). In winding any inductor, it's important to ensure that saturation will not occur.

Saturation is when the core material cannot support any additional magnetic field, which can lead to loss of inductance.

The number of turns on your inductor will depend on the desired inductance. There are online calculators and formulas available to help you determine this.

The number and direction of the turns will determine the final value. In this case Dino is able to validate the inductance accurately as he has the equipment to do so.

Stay tuned for further updates.

~

*From Pierre F6IDT: Thanks go to Dino who is not on his first kit and who puts all his energy into helping those who embark on these projects.*

*And congratulations to John your editor who produces a professional magazine, which we can't wait to download and read. And in this last issue I saw the description of the beacon, a very nice article!*

*Bravo for promoting amateur radio as you do, hoping that young people will take over.*

*With my cordials, 73*

# Burnt resistor sleuthing

## What to do when you let the magic smoke out

by AL WILLIAMS

You smell smoke and the piece of gear you are working on stops working, probably at an inopportune time. You open it up and immediately see the burned remains of a resistor. You don't have the schematic, the Internet has nothing to say, and the markings on the resistor are burned away. What do you do? [Learn Electronics Repair] has some advice.

The resistor is probably open, but even if it isn't, you can't count on any measurement you make. The burning could easily change the value.

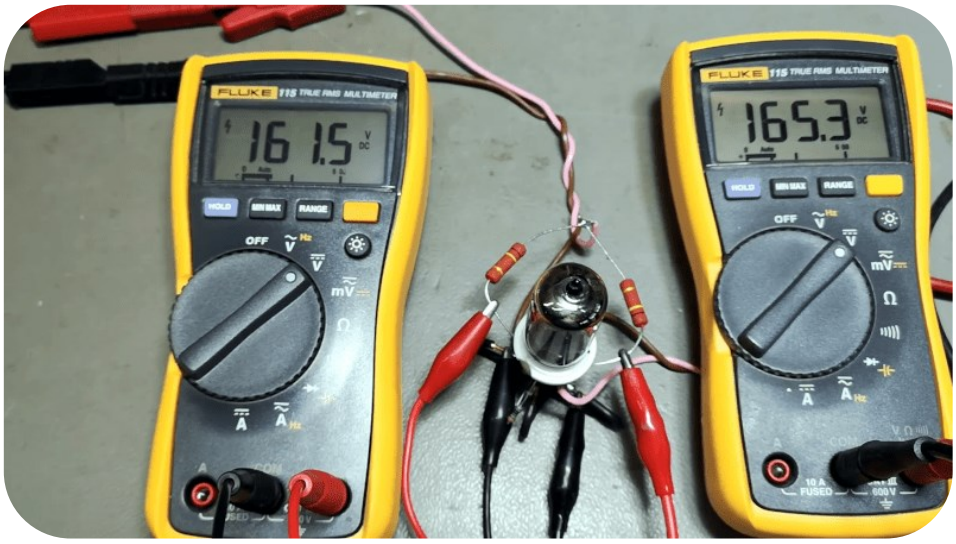
How To Find The Value Of A Burnt Open Circuit Unmarked Resistor
HOW TO MEASURE
A BURNT RESISTOR
Watch on YouTube
TRONICS REPAIR

The technique comes from comments on one of his earlier videos where he had such a burned resistor but was able to find the correct value. He decided to test the suggestion: cut away the burned resistor and measure the pieces that are left. It probably won't give you the exact value, but it will get you in the ballpark.

So a rotary tool did the surgery, and you can see it all in the video below. We aren't sure this method would work on every type of resistor you might encounter, and surface mount will also present special problems. However, if you are stabbing in the dark anyway, it won't hurt to try.

Everyone knows the smoke that comes out is magic. Sometimes, you cut into components by necessity. Other times, it is for art's sake.

~ *Hackaday*




# Roll your own simple tube tester

by HACKADAY / AL WILLIAMS

You can easily get carried away when trying to test things. For example, if you want to know if your car is working, you could measure the timing of the ignition and put the car on a dynamometer. Or you could just start it and figure that if it runs and moves when you put it in drive, it is probably fine.

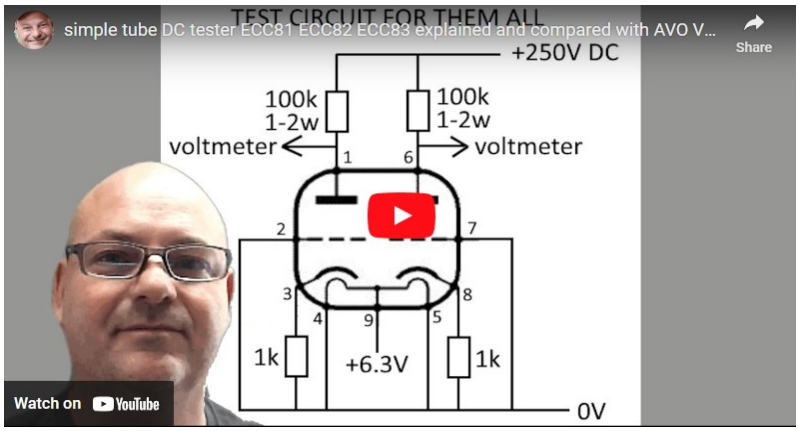
When [Thomas Scherrer] wanted to test some tubes, he made the same kind of assumption. While tubes can develop wacky failure modes, the normal difference between a working tube and a failing tube is usually not very subtle. He made a simple test rig to test tubes at DC and one operating point. Not comprehensive, but good enough most of the time. Have a look at what he did in the video below.

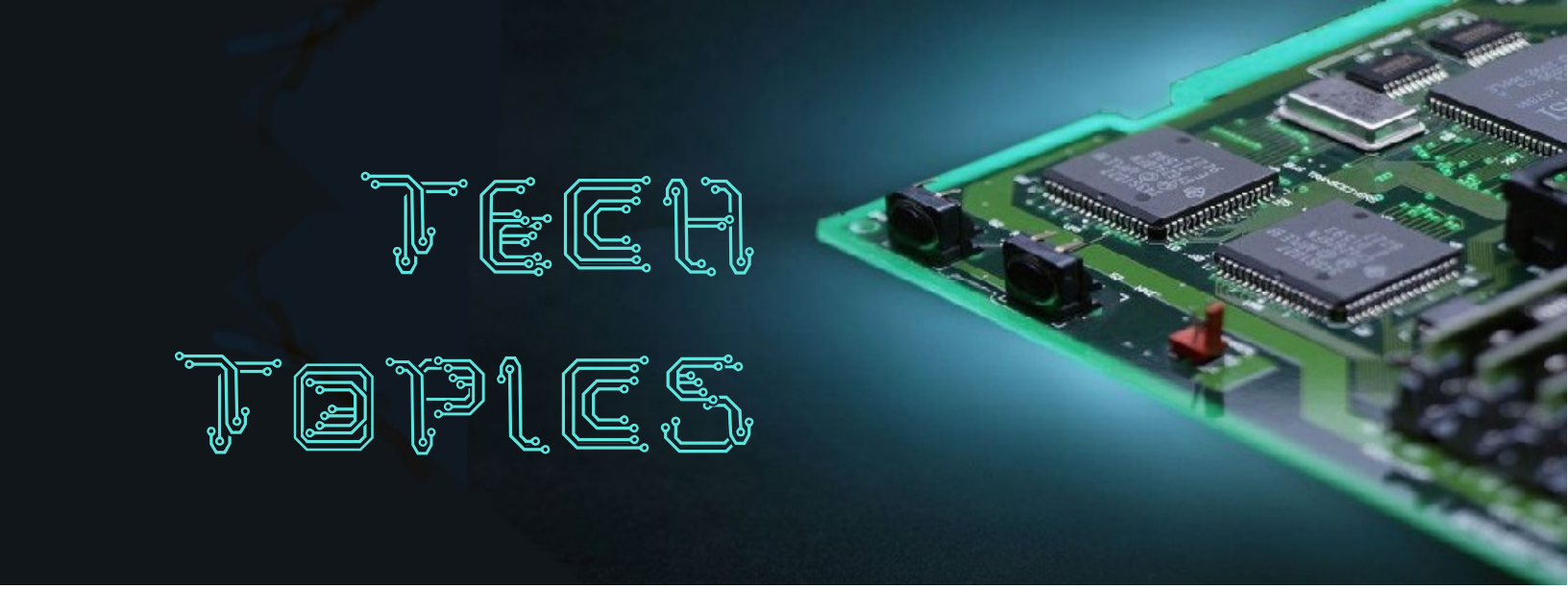
The tester is just a few resistors, a tube socket, and some bench power supplies. Of course, you may have to adapt it to whatever tube you are testing. If we had a lot of tubes to do, we might make the rig a bit more permanent, but for an afternoon of testing, what he has would be fine.

In addition to the power supplies, you'll need at least one, preferably two, volt meters. He was able to validate his results with a proper tube tester. The results matched up well. While this won't solve all your tube testing problems, it will give you a quick start.

You can build your own modern tube tester, of course. Or pick up a vintage one. Our favorite one uses punched cards.

~ *Hackaday / Al Williams*
*Roll Your Own Simple Tube Tester |*






# The crowbar circuit

## Protecting electronics from overvoltage surges

by John Schouten VE7TI based on a video by Tom Apalenek WA2IVD

**Tom Apalenek WA2IVD** was first licensed in 1974 when he was in high school. Tom has dabbled in many different facets of ham radio over the years, and has spent most of his active time doing public service and emergency communications. When they moved to California in 2009, I became active in the local SATERN group in San Bernardino County.

In the realm of electronics, protection is paramount. The crowbar circuit, a lesser-known hero of electrical engineering, plays a crucial role in safeguarding sensitive devices from overvoltage and surge conditions. Think of it as an electrical sentinel that stands ready to intervene when the power supply unit starts delivering excessive voltage. This article explores the workings of a crowbar circuit, its applications, and its role in preventing catastrophic damage to electronic circuits. As pointed out in a video presented by Tom WA2IVD, we often spend thousands on expensive transceivers yet scrimp on poorly protected power supplies.

### Understanding the Crowbar Circuit

A crowbar circuit derives its name from the act of throwing a crowbar across exposed power supply terminals, effectively short-circuiting the output. However, instead of a physical crowbar, this circuit employs electronic components to achieve the same result.

At its core, the crowbar circuit serves as a protective mechanism against overvoltage situations. Its primary function is to prevent the voltage output (Vo) of a power supply unit from exceeding safe levels, which could potentially damage the connected circuits. The crowbar circuit operates by

rapidly creating a short circuit or a low-resistance path across the power supply output terminals, thereby diverting excess voltage away from the sensitive equipment.

## Components and Triggering

Crowbar circuits are frequently designed using various shorting devices such as thyristors, TRIACs, trisils, or thyratrons. These devices, once triggered, rapidly connect the output terminals, allowing the excessive voltage to be dissipated elsewhere.

One common example of a crowbar circuit uses an LM431 adjustable zener regulator to control a TRIAC. A resistor divider sets the reference voltage for the LM431, and during normal operation, the circuit remains inactive. However, when the supply voltage increases beyond safe levels, the LM431 triggers the TRIAC, creating a low-resistance path and protecting the connected electronics.

## Operation and Key Distinctions

A crowbar circuit stands apart from clamps in its operation. While clamps merely prevent voltage from exceeding a preset level, a crowbar forcefully and rapidly brings the voltage down, often close to ground voltage. The crowbar doesn't automatically return to normal operation once the overvoltage condition is resolved. Power must be removed entirely to allow the crowbar to revert to its neutral state.

There's also the concept of an active crowbar, which can remove the short circuit once the transient overvoltage situation is resolved. Active crowbars often employ transistors or specialized thyristors and are commonly used to protect equipment against high voltage and current transients. They can quickly return the device to normal operation after an overvoltage event, a crucial feature in various applications.

## Advantages of Crowbars

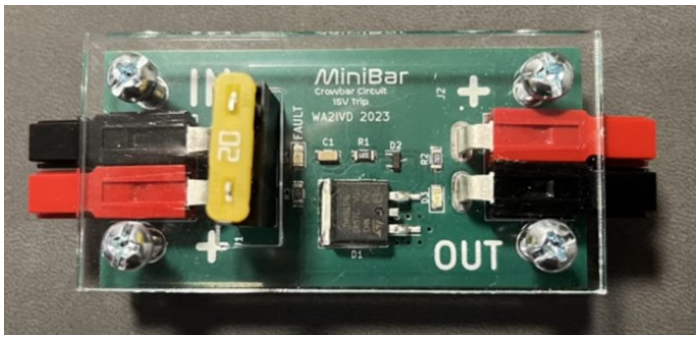
Crowbars offer several advantages over clamps. Their low holding voltage allows them to carry higher fault currents without dissipating much power, which can prevent overheating. Furthermore, a crowbar is more likely to deactivate a device by blowing a fuse or tripping a circuit breaker, drawing immediate attention to the faulty equipment.

## Applications

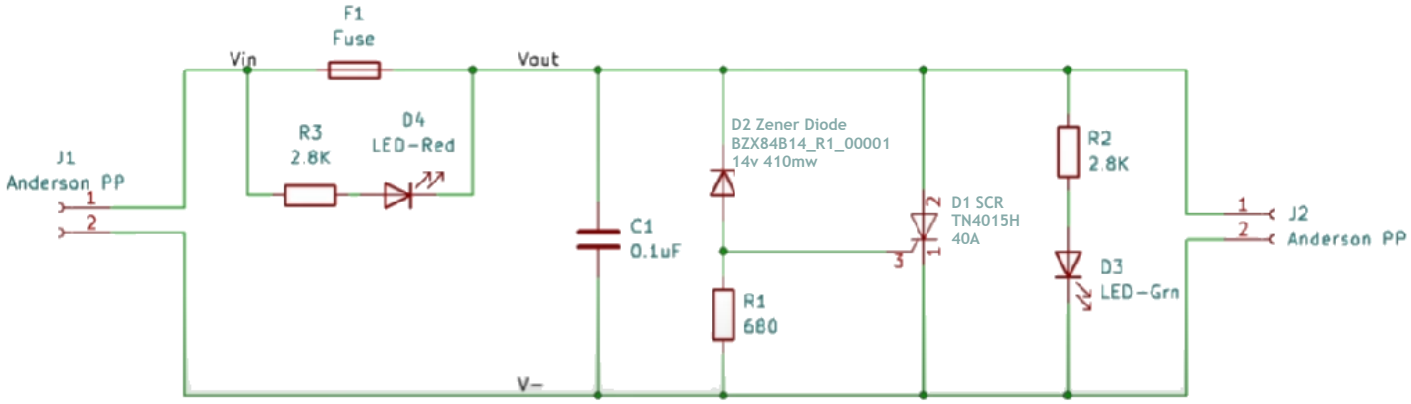
Crowbar circuits find applications in various settings:

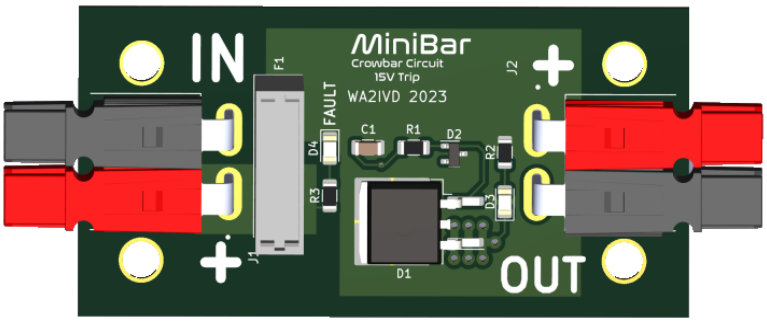
- Benchtop Power Supplies: Many quality benchtop power supplies **integrate crowbar circuits** to protect the equipment connected to them. Yours may have it already.
- Microwave Ovens: These household appliances often feature a crowbar-like mechanism in the door latch assembly, which ensures that the magnetron cannot be energized when the door is open. This safety measure prevents accidents and equipment damage.

In his video, WA2IVD explains what crowbar circuits are and how they work. It also introduces the MiniBar. This is a small crowbar circuit with a built-in fuse and Anderson PowerPoles for the input and output. It is designed to go between a power supply and transceiver, or any other sensitive, electronic load.




*WA2IVD MiniBar Crowbar circuit*




The Mini-Bar is designed to trip at about 15 volts. This is conservatively below the maximum voltage for most radios. At the same time, it is well above the normal power supply voltage of 13.8 volts and also well above normal automotive alternator charging voltages.

In Tom's PC board version of the circuit, the top and bottom planes on the board are made with 2 oz. copper instead of the usual 1 oz. With 15 amps of continuous current, the PCB got slightly warm, but not hot. At 20 amps continuous, the board got pretty hot after 1 minute. He believes the PC board version should be fine with up to 30 amps at a 50% duty cycle of 30 seconds transmit and 30 seconds receive. This should be more than adequate for a 100 watt radio, although I wonder if replacing the (+) and (-) bus with a heavy gauge wire would resolve that heating issue).

Tom WA2IVD sells the MiniBars from his website. If you would rather build your own, Tom has generously placed a schematic and theory of operation info in the Projects section of the website, and also included a complete KiCad project archive if you want to make your own PC boards or modify the design. It could also be built with through-hole components on perf board.

Here's a link to the project: https://a-2-z.tech/home/projects/mini

A video about the device is at:

https://www.youtube.com/watch?v=pkiPsysIpM8

Here at SARC we are looking at it as a club build project. I'm quite impressed by Tom's videos and they're a must if you have an IC-7300 or similar Icom transceiver. I have found a treasure trove of information and user guides for these transceivers. Check out: https://www.youtube.com/@HamRadioA2Z/videos

The crowbar circuit is a crucial component in the world of electronics, acting as a vigilant protector against overvoltage surges. By swiftly short-circuiting power supply outputs when needed, it prevents catastrophic damage to sensitive electronic equipment. If not already equipped, your sophisticated transceivers and power supplies depend on crowbar circuits to silently stand guard, ensuring the safety and integrity of the connected devices.

*~ John VE7TI*

# The Importance of Choosing the Right Fuses to Protect Your Electronics

## Another take on protecting electronics from excessive current

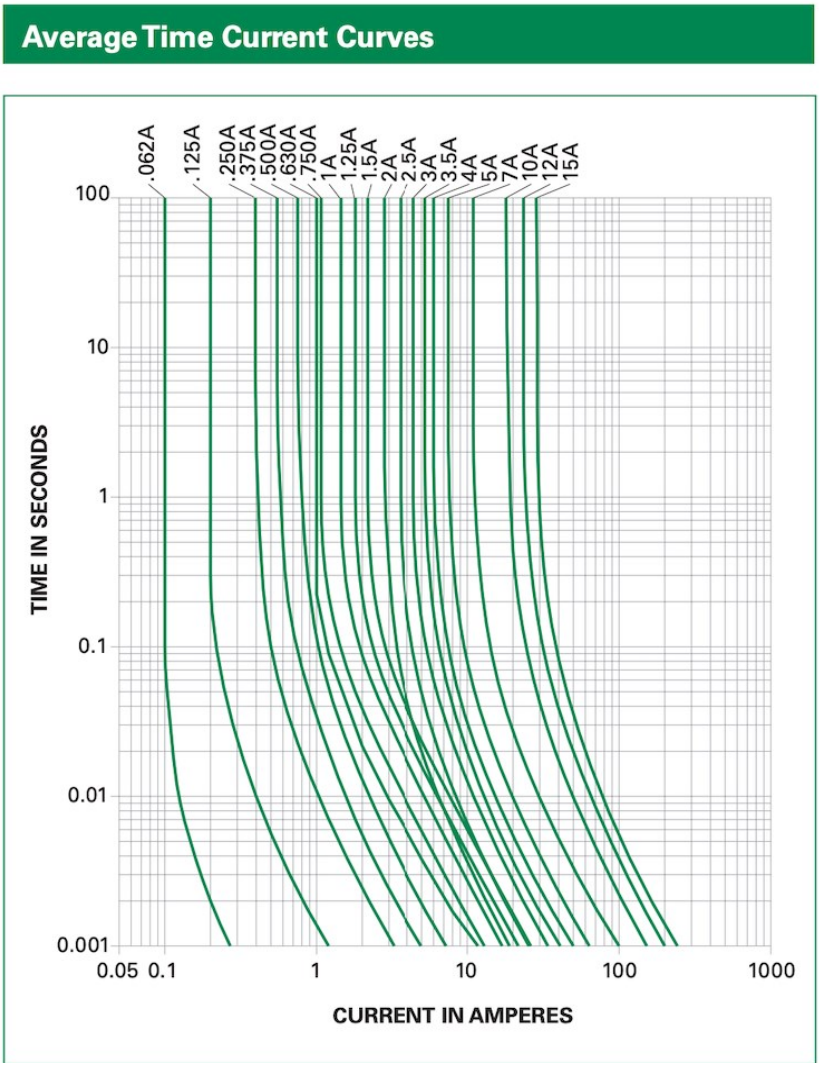
by John Schouten VE7TI based on a video by Tom Apalenek WA2IVD

Fuses are essential components in any electrical system, designed to protect the wiring and equipment from excessive current flow. While many people may think that fuses are primarily there to safeguard electronic equipment like radios and amplifiers, their primary purpose is to prevent wiring from melting and causing potential fires. I recently became a subscriber to the HamRadioA2Z YouTube channel of Tom WA2IVD. Tom's channel first caught my attention for his great videos on the IC-7300 but I soon found myself checking out his other videos and projects. In his video "Don't buy these fuses", Tom explores the misconceptions surrounding fuses and delves into the critical role they play in protecting your equipment and your safety.

We have covered the topic in previous issues of The Communicator, and on our blog: https://ve7sar.blogspot.com/2018/07/using-fuses-effectively.html, and we have suggested 12 volt circuit breakers as an effective alternative.

### The Primary Role of Fuses

One of the common misconceptions is that fuses are primarily meant to protect your electronic equipment. However, their primary purpose is to protect the wiring in your electrical system. When a current overload occurs, the fuse's role is to blow or clear, preventing excessive current from flowing through the wiring, which could otherwise cause the wires to heat up, melt, and potentially lead to fires. Therefore, the safety of your wiring and, by extension, your home or workspace is the primary concern of fuses.




## Secondary Equipment Protection

While the primary function of fuses is to safeguard the wiring, they can also serve as a secondary defense for your electronic equipment. If a short circuit occurs within your electronic device, a properly sized fuse can respond quickly by blowing, interrupting the current flow, and potentially limiting the damage. It's important to note that fuses may not always prevent damage entirely, but they can help confine it to the faulty component, reducing the risk of a more extensive equipment failure.

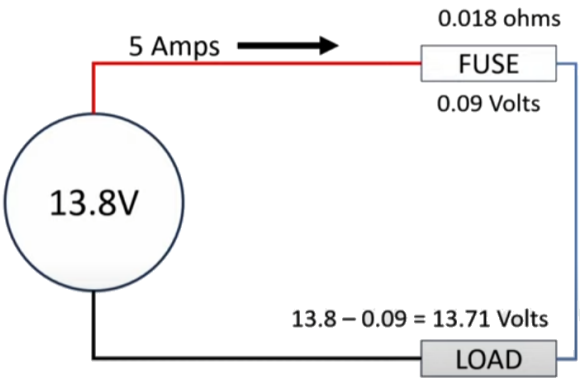
## Understanding Fuse Characteristics

To comprehend how fuses operate and their critical role in electrical safety, it's essential to consider their characteristics and the relationship between current and time. Fuses have what's called a "characteristic melting curve," which depicts the time it takes for a fuse to blow or clear at different levels of current.

Using a datasheet for Bussmann ATC fuses *[left]* as an example, you can observe the characteristic melting curves for various amperage ratings. The vertical axis represents time in seconds, while the horizontal axis represents current in amperes. The chart's scaling is logarithmic, with the scales based on powers of 10. This means that as you move up or to the right on the chart, the distance between numbers becomes shorter.

Tom took a 5-amp fuse as an example. At the top of the chart, you'll notice that it would take hours to clear when carrying just over 6 amps. As the current increases, the time it takes to clear the fuse decreases. For instance, at 10 amps, it should take about 0.7 seconds, and at 20 amps, approximately 0.5 seconds to blow the fuse.

It's important to remember that this chart provides average melt times, and not every fuse will follow the lines exactly. An electrical characteristics table in the



datasheet provides a range of clearing times relative to the fuse's rating, allowing you to gauge the expected response times for various current levels.

## Testing Fuse Quality

Tom's testing set-up is explained in a second follow-up video *[https://www.youtube.com/watch?v=mJ97tVmZizQ]*. It is important because there is a demonstration how the wiring smokes and burns while the fuse stays intact. It points out that the quality and reliability of fuses can vary significantly depending on the manufacturer and the specific brand. To illustrate this point, he tested various fuses, including generic and brand-name options. The results showed a notable difference in how quickly these fuses responded to overcurrent conditions.

The generic 5-amp fuses tested in the experiment proved to be inadequate, as they did not blow even when subjected to 20 amps for over three minutes. In contrast, brand-name fuses, both 5-amp and 15-amp, exhibited the expected response times, with the 15-amp fuses clearing within seconds when exposed to 20 amps.

Fuses are vital components in electrical systems, primarily designed to protect wiring from overheating and potential fires. While they can provide secondary protection to electronic equipment, it's crucial to choose high-quality, brand-name fuses to ensure that they respond appropriately to overcurrent conditions. Generic fuses may not provide the level of protection needed, potentially putting your equipment and safety at risk.

When it comes to electrical safety, investing in reputable fuses is a small yet significant step that can make a world of difference. Whether you are a ham radio enthusiast or simply someone concerned about the safety of their electronic equipment, the choice of fuses plays a critical role in ensuring your system's reliability and protection.

Ohm's Law, symbolized as V = IR, is a fundamental principle in electrical engineering that explains the relationship between voltage, current, and resistance in an electrical circuit. Understanding this law is crucial for ensuring the safe and reliable operation of electronic devices and systems. In this article, we'll delve into the practical application of Ohm's Law and explore the importance of fuses in safeguarding electrical circuits.

## Ohm's Law and Its Practical Application

Ohm's Law, represented as V *(or E)* = IR, emphasizes the interplay between voltage (V), current (I), and resistance (R) in electrical circuits. By rearranging the formula, we can derive three essential equations:

Voltage (V) = Current (I) × Resistance (R)

Current (I) = Voltage (V) / Resistance (R)

Resistance (R) = Voltage (V) / Current (I)

These equations demonstrate that by knowing any two of the three parameters, you can calculate the third. This versatility is the key to manipulating and controlling electrical circuits effectively.

## Series Circuits and the Importance of Current

In a series circuit, all components are connected in a single path from the voltage source to the load and back to the source. An essential principle of series circuits is that the current is equal in all elements of the circuit. If, for instance, 10 amps flow through the circuit, the voltage source, the fuse, and the load all carry 10 amps.

## Fuse Resistance and Its Impact

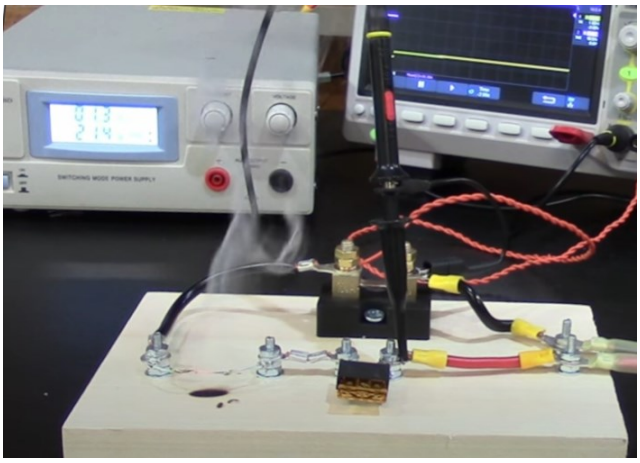
To illustrate the significance of these principles, let's consider the role of a fuse in protecting an electrical circuit. A fuse, as a protective device, has a specific resistance value. For example, a 5-amp fuse might have a resistance of approximately 0.018 ohms (0.01785 ohms).

Now, if we have a functioning circuit with a 5-amp current, the voltage drop across the fuse can be calculated using Ohm's Law (V = IR). This means that 5 amps × 0.018 ohms = 0.09 volts will be dropped across the fuse. However, since the current is uniform throughout the circuit, the load will experience a slightly lower voltage than the source, accounting for the resistance in the fuse. In this case, the load receives approximately 13.71 volts.

## Testing Fuses in Real-World Scenarios

To demonstrate the practical implications of fuse protection, Tom conducted experiments with various fuses, load types, and power sources. He used a motorcycle battery to simulate a high-current source and tested the reaction of different fuses to varying loads.

## The Results



Using a no-name 5-amp fuse, Tom observed the fuse blowing almost instantly when subjected to a heavy load.

Repeating the test with a 24-gauge wire as the load, the fuse blew rapidly, with a small puff of smoke coming from the wire, indicating potential damage to the equipment.

When he used a 5-amp Bussmann fuse with the same setup, the fuse blew rapidly but without the puff of smoke, suggesting better protection for the equipment.

Finally, he tested the same 5-amp no-name fuse with a longer 24-gauge wire, revealing that the wire insulation burned to protect the fuse *[photo below left]*.

## Conclusions

The experiments highlight the critical role of fuses in protecting electrical circuits from overcurrent conditions. The choice of fuse and its characteristics, such as resistance and response time, can significantly impact the safety of your equipment. For higher current sources, no-name fuses may suffice, but caution is advised when dealing with limited current supplies.

In essence, understanding Ohm's Law and the practical implications of fuse protection is vital for maintaining the safety and functionality of electrical circuits, ensuring that they operate within their specified parameters. Whether you're working with a high-current power source or a low-capacity battery, the choice of fuses can make a substantial difference in safeguarding your electrical systems.

Is your expensive amateur radio equipment sufficiently protected by a dollar store generic fuse? Mine is not, and I have some new fuses to buy.

*~ John VE7TI*

# Soldering Skills For Success

## The basics of how to solder for electronics

By JOHN SCHOUTEN VE7TI and DINO GUEORGUIEV VE7NX

# Basic Circuit Soldering Equipment, Techniques, and Safety

*Soldering is a fundamental skill in electronics and circuit assembly and a common skill for Amateur Radio operators. This introduction provides a guide to basic soldering equipment, techniques, and safety procedures. Proper soldering ensures reliable connections in electronic circuits and prevents electrical and fire hazards.*

### 1. Introduction

In our SARC workshop we teach the basics skills of electronics soldering and assemble an LED Christmas tree circuit board kit, readily available on Amazon or AliExpress, using these skills. Other groups may wish to offer a similar program, particularly to new hams, who asked for this session, and were eager to participate.

## 2. Safety Precautions

Safety should always be the top priority when soldering. Follow these precautions to minimize risks:

### 2.1. Personal Safety

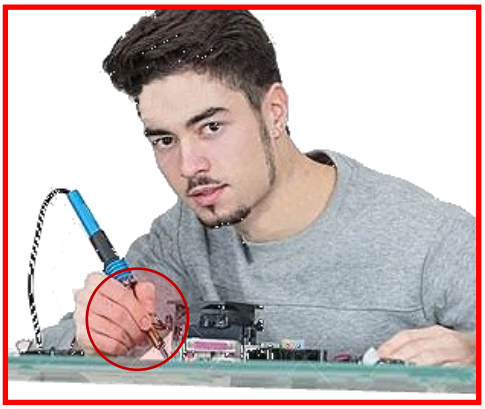
Eye Protection: Wear safety glasses to protect your eyes from splattering solder.

Respiratory Protection: Use a well-ventilated area or wear a mask to avoid inhaling solder fumes.

Clothing: Avoid loose or flammable clothing, and wear heat-resistant gloves if necessary.

Flammable Materials: Keep flammable materials away from your soldering area.

And a final personal safety tip, don't hold your soldering pencil like this!



### 2.2. Electrical Safety

Disconnect Power: Ensure that the circuit or device you are soldering is completely powered off and unplugged.

Ground Yourself: If you are working on sensitive components subject to electrostatic discharge, use an anti-static wrist strap to prevent static discharge that could damage sensitive components.

### 2.3. Fire Safety

Fire Extinguisher: Have a fire extinguisher nearby in case of accidents.

Fire-Safe Work Area: Keep a fire-resistant surface (like a ceramic tile) beneath your soldering iron.

No Water: Never use water to extinguish soldering-related fires; use a fire extinguisher.

## 3. Soldering Equipment

### 3.1. Soldering Iron

Choose a pencil soldering iron with adjustable temperature control (typically 25-60 watts for most circuit applications).

Ensure the iron has a comfortable handle and a replaceable tip.

A soldering gun is too hot and clumsy for circuit board work but very useful for installing large connectors.

### 3.2. Soldering Tips

Use the appropriate tip for your soldering job (fine tips for delicate work, chisel tips for larger joints). For our workshop we recommend a fine, pointed tip.

Keep tips clean and tinned (coated with solder) for efficient heat transfer.

### 3.3. Solder

Select the right type of solder (lead-free or leaded) based on your needs.

Common solder sizes are 0.032" (0.8mm) and 0.062" (1.6mm) in diameter. For our project, and most circuit board applications, we recommend a 0.8mm thin solder.

### 3.4. Solder Pencil Stand

A stand with a dampened sponge or brass wool helps clean and maintain the soldering iron tip.

### 3.5. Helping Hands

Use a soldering station with adjustable arms or clips to hold circuit boards and components in place.

### 3.6. Suitable Base Mat

Protect your desk or work surface. Quilter's mats are tough and very forgiving for solder spills and tool cuts. *Check Princess auto C$10.*

### 3.7. Parts Tray

Keep your parts well-organized. I find a small dollar store muffin tin works very well.

### 3.8. Magnifying Glass

Especially for those of us getting a bit older, a magnifying glass helps with parts identification and to detect substandard joints. *Check Princess auto for a large magnifier with LED illumination C$6.*

### 3.9. Digital Multimeter or Parts Identifier

Inexpensive DMMs are common. They will measure voltage, help to confirm the value of resistors and detect open and short circuits. *Check Princess auto or Amazon ~C$10-15.*

There is a parts tester, known as a T7 that does a good job of identifying and testing parts. It's recommended by Dino. *C$23 on Amazon.ca*.

### 3.10. Basic hand tools

A sharp cutting plier, a fine pair of needle-nose pliers, and a large needle or wooden toothpicks (if you need to clear a solder covered circuit board hole).

Nice to have but not required is a solder-sucker for clearing solder from a joint.

## 4. Soldering Techniques

### 4.1. Preparation

- Clean the soldering iron tip with a damp sponge or brass wool.
- Tin the tip by coating it with a small amount of solder.
- Position components, wires, and PCB pads for soldering.

### 4.2. Tinning Technique

- Apply a small amount of solder to any bare wire.
- Heat the joint with the soldering iron and touch the solder to it.

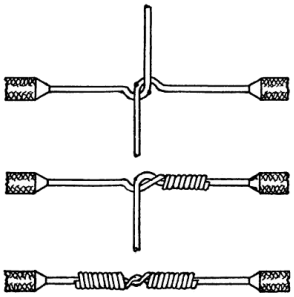
The solder should melt and flow smoothly, evenly coating the joint.

### 4.3. Soldering

- Heat the joint with the soldering iron, ensuring it touches both the wire/lead and the pad.
- Most important… always apply solder to the joint (not the soldering iron), allowing it to flow and bond the components. The solder should flow smoothly.
- Remove the soldering iron and let the joint cool naturally without moving it. It should remain relatively shiny, not dull or grainy.

### 4.4. A Basic Wire Splice Exercise

The 'Western Union' splice has been around since the mid 1800s and results in a joint stronger than the wire itself. This joint is illustrated below. Twist the wire as shown and solder.



### 4.5. Clean-Up

- Trim excess wire leads and inspect joints for quality.
- Clean the soldering iron tip before the next joint.
- Dispose of waste solder and other materials properly.

## 5. Troubleshooting

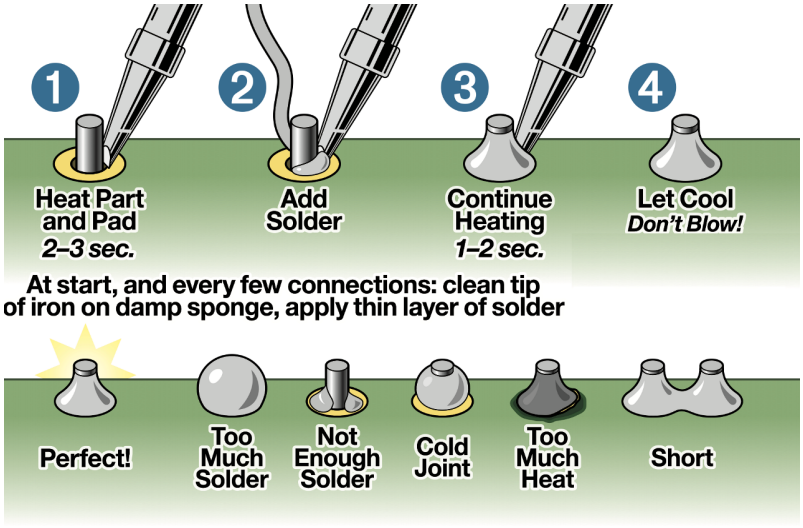
### 5.1. Common Issues

**Cold Joints:** Joints that look grainy or dull often do not make a good electrical bond. Reheat and apply more solder.

**Solder Bridges:** Remove excess solder and ensure there's no unintentional connection between pins or traces.

**Overheating:** Avoid overheating components to prevent damage to them and your circuit board.

See the illustration on the next page.




## 6. Maintenance

### 6.1. Soldering Iron Care

- Keep the soldering iron clean and tinned.
- Replace worn-out tips promptly.
- Store the iron in a stand when not in use.

### 6.2. Safety Equipment

Regularly inspect and maintain safety glasses, gloves, and other safety gear.

## 7. Recommended videos

Please watch these videos prior to attending the workshop.

### 7.1. Soldering Tutorial for Beginners

https://youtu.be/Qps9woUGkvI?si=8O25rvqRiJKvYwPW

### 7.2. Soldering Crash Course

https://youtu.be/6rmErwU5E-k?si=Onlzh9ck0is1zISH

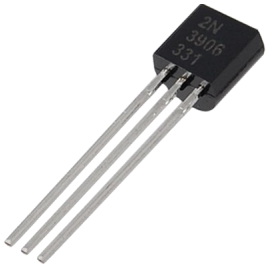
## 8. Conclusion

Soldering is an essential skill for anyone working with electronics. By following the safety precautions, understanding your equipment, and mastering soldering techniques, you can create reliable and durable connections in your circuits. Remember that practice makes perfect, so keep honing your soldering skills for better results and safety.

## 9. The LED Christmas tree kit project components.

These are resistors. They come in two values, 100 Ohms and 4.7 Kilohms and have no polarity.

These are 47uF electrolytic capacitors. Note that one lead is longer than the other, This is the positive (+) lead, and you must observe polarity when inserting them into the circuit board as marked.



These are 9014 transistors with an emitter, base and collector lead. Note the shape of the package is flat on one side. They must be inserted as indicated by the print on the circuit board.

There are 37 seven-colour multicolor Light Emitting Diodes (LED). They incorporate several emitters of different colours supplied by only two lead-out wires. Colours are switched internally by varying the supply voltage, which is done by the other components as they charge and discharge. Like the capacitors they are polarized with the longer lead being positive (+). Insert them correctly and do not install the top LED until after the two boards are joined.

Our kit is from AliExpress

# The LED Christmas Tree Kit

## Basic circuit soldering skills

By JOHN SCHOUTEN VE7TI and DINO GUEORGUIEV VE7NX

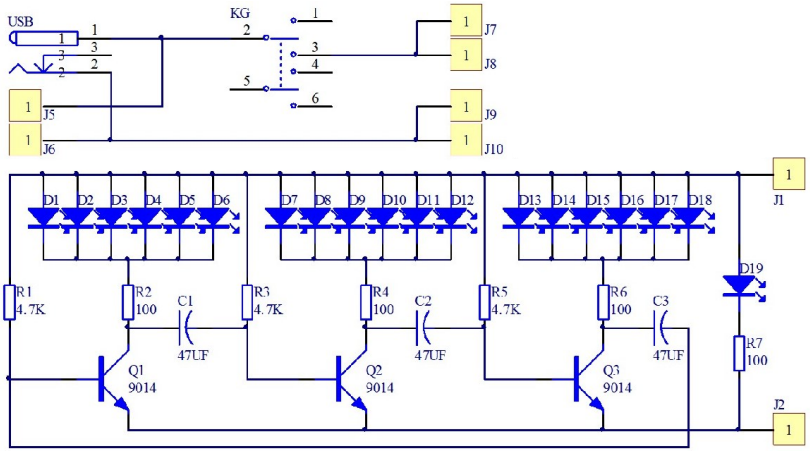
### Kit introduction

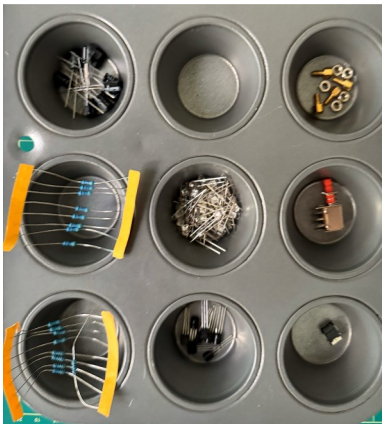
This colorful Christmas tree kit is composed of two light boards and a light board base, forming a tree-like shape. The colorful LEDs on the edge of the two light boards alternately flash, automatically changing through seven colors.

### Circuit principle

The 18 LEDs per board are divided into three groups. When the power is turned on, three transistors per board will contend for conduction, Due to the slight differences in component value, only one transistor is turned on first. Let's assume that it is transistor Q1, then LEDs D1-D6 light. Because Q1 is turned on, its collector voltage drops so that the left end of capacitor C1 falls, close to 0V. The base of Q2 is also connected to approximately zero Volts, and Q2 is cut off. Therefore, the LED group D7-D12 connected to its collector is off; at this time, the high voltage of Q2 increases the voltage of the collector of Q3 through the capacitor C2, and Q3 will also turn on quickly, and the LED group D13-D18 lights up, so during a period of time, the collectors of Q1 and Q3 are all low level, the two LED groups D1-D6 and D13-D18 are lit, and the LED group D7-D12 is off, but the power charges C1 through resistor R3. The Q2 base voltage gradually rises. When it exceeds 0.7V, Q2 changes from the off state to the on state, the collector voltage drops, and the D7-D12 LED group illuminates. At the same time, the collector voltage of Q2 drops. C2 causes the base voltage of Q3 to also decrease, Q3 turns off, and its collector voltage rises, LEDs D13-D18 are off but, in accordance with the loop circuit described above, three LEDs will light up in turn, and two sets are lit at the same time, the cycle repeats, to achieve the oscillating flashing pattern.

### Construction

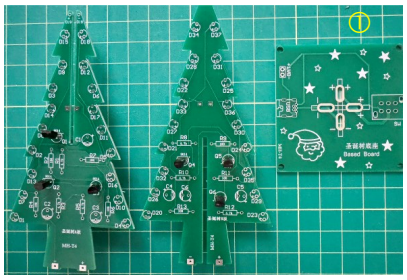




We recommend that you first sort the parts into individual piles. Note the colour code of the 100 Ohm resistors (brown-black-brown), and the 4.7K resistors (yellow-violet-red). Best to confirm the values with an Ohm meter as the resistors are small and the colour bands are dull.

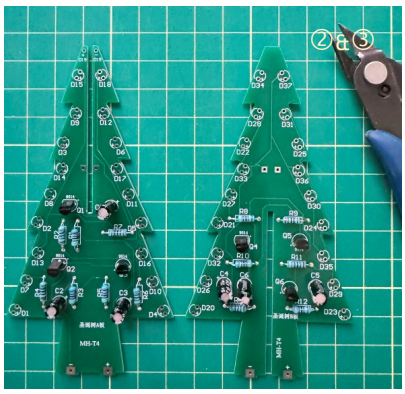
The circuit boards are well marked for the position, value and orientation of the electronic components.

1. Start by soldering the six transistors on the A and B circuit boards. AVOID EXCESSIVE HEAT, a quick touch with the iron and solder should suffice. Note the orientation on the flat side of the transistor! Place them as far into the circuit board as possible. Clip the leads after soldering.




2. Solder the seven 100 Ohm and then the six 4.7 Kilohm resistors. Polarity is not important.

3. Next solder the six electrolytic capacitors. The longer lead is positive (+) and they must be oriented in the correct polarity.

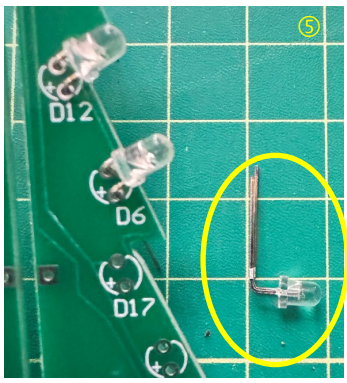



4. Before soldering the LEDs, turn over the boards and check for any poor solder joints with a magnifying glass.

5. You can mount the LEDs flat on the circuit boards or, using your pliers, bend the leads at 90 degrees so that they face outwards. It is easier if you insert them 2 or 3 at a time, skipping each alternate one before soldering. This makes them easier to solder because the adjacent leads do not get in the way. Orient the longer lead to the positive (+) marking on the boards.

6. Once you have done one set, go back and fill in the missing LEDs. Do not mount the very top LED until the two boards are joined.

7. After completing soldering a board, you can use the battery holder to connect to the positive and negative pads on the board. Test to see if all the LEDs light and sequence. If not, check the solder joints

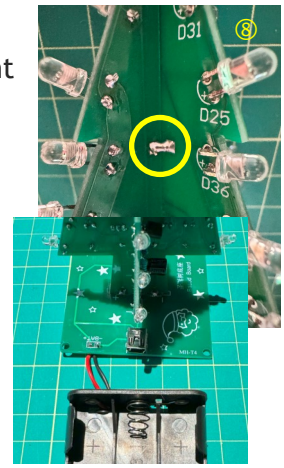



8. Once both tree boards are soldered, slide them together, and align them to join the centre solder pads in 4 places between the boards.

9. Install the final LED at the top.

10. Solder the components of the bottom plate. The mini-USB jack has particularly close pin spacing. Be careful not to bridge the pads.

11. When assembling the light boards to the bottom board, pay attention to the one-to-one polarity correspondence between the light boards and the positive and negative poles of the bottom board.




12. Solder the battery holder to the bottom board.

**You're done—Merry Christmas!**

*~ John VE7TI*

# AC measurements made easy

## Hackaday prize 2023

by BRIAN COCKFIELD

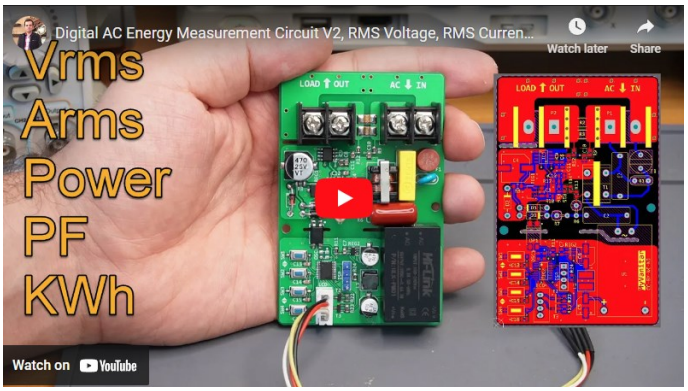
When working on simple DC systems, a small low-cost multimeter from the hardware store will get the job done well enough. Often they have the capability for measuring AC, but this is where cheap meters can get tripped up. Unless the waveform is a perfect sinusoid at a specific frequency, their simple algorithms won't be able to give accurate readings like a high-quality meter will. [hesam.moshiri] took this as a design challenge, though, and built an AC multimeter to take into account some of the edge cases that come up when working with AC circuits, especially when dealing with inductive loads.

The small meter, an upgrade from a previous Arduino version that is now based on the ESP32, is capable of assessing root mean square (RMS) voltage, RMS current, active power, power factor, and energy consumption after first being calibrated using the included push buttons. Readings are given via a small OLED screen and have an accuracy rate of 0.5% or better. The board also includes modern design considerations such as galvanic isolation between the measurement side of the meter and the user interface side, each with its own isolated power supply. The schematics and bill -of-materials are also available for anyone looking to recreate or build on this design.

With the project built on an easily-accessible platform like the ESP32, it would be possible to use this as a base to measure other types of signals as well. Square and triangle waves, as well as signals with a large amount of harmonics or with varying frequencies, all need different measurement techniques in order to get accurate readings. Take a look at this classic multimeter to see what that entails.

~ *Hackaday*

*Original article at: Hackaday Prize 2023: AC Measurements Made Easy | Hackaday*



# Yaesu FT-857D off-grid portable kit

## A detailed description of a compact portable kit

by ANDREW MATECHA VA7EKA

**Andrew Matecha VA7EKA** is one of our SARC Basic course graduates. He has been on the air since April 2022.

As part of my amateur radio operations, I've quickly seen the advantage of having a small, portable radio I can operate anywhere and deploy quickly. Especially as I don't have a permanent HF antenna installation at home, being able to set up in the yard (or even indoors) in a pinch is pretty high on the list of requirements for me.

I started reading online and watching videos about this topic, and found an excellent video from KT7RUN "The Tech Prepper" (and an earlier one) which showed a super-slick portable radio setup featuring the Yaesu FT-857D. Prior to finding those videos, I had already acquired an FT-857D due to its all-band, all-mode operation and compact size, and Gaston KT7RUN's kit seemed like a very compelling setup for this radio.

Shown above is what I've ended up with for my off-grid-capable "grab'n'go" radio station. A photo of the completed portable kit. A Yaesu 857D in the TPA-857B pack frame is standing vertically on a glass table, inside a black pouch/bag. A smaller pouch is attached to the front of the bag, with connecting black and red wires between the two bags. A vertical antenna is attached to one of the BNC connections at the top of the pack frame. A fluorescent orange wire winder, also on the table, has some yellow wire on it - this is the EFHW antenna. A small 64-to-1 impedance transformation balun in a small black enclosure is also shown. *[click any image to view it full-size in a new tab]*

## Inventory

Currently this is the inventory for this kit:

- Yaesu FT-857D transceiver
- Armolog TPA-857B pack frame
- Armolog DDM-DGRG Digirig mounting platform
- High Ground Gear PRC-117G pouch (purchased from Optics Planet so I could get it in black, plus it was never in stock on High Ground's website after literally months of watching for it)
- "WYNEX" MOLLE-compatible pouch (using the larger of the two)
- Dakota Lithium 12v 10ah LiFePo4 battery
- PowerPole Power Distribution Block
- Digirig Mobile USB digital interface
- 3.5mm audio extension cable to relocate the CW key input

Antenna options:

- 40m EFHW from Malen VE6VID (thanks again!)
- 20m vertical from AliExpress
- 2m/70cm SignalStuff Signal Stick

and for charging this station in the field…

- 75-watt solar panel (got this for $80 CAD on sale - couldn't say no to that!)
- Genasun GV-10-Li-14.2 (as recommended by Julian OH8STN)

## Details

Of course the core of this kit is the radio. It's popular for a reason. All-band, all-mode "shack in a box" in a truly portable form factor. Capable of 100w operation, it's more than enough to make whatever contacts you need. In my case, because the battery has a max 20A continuous-discharge specification, I wouldn't actually transmit at a full 100w with this exact configuration. Not a problem - I'm not expecting to transmit at those levels with a pack of this size.

The pack frame is truly solid, though it adds a good amount of weight (1.364lbs with all options). It's absolutely worth it though. Not only does it provide rigidity and protection, it also provides convenient mount points for attachments, like the relocated antenna connections and Digirig holster. I could securely attach additional items if needed.

The battery *just* fits into the MOLLE pouch which is pretty lucky. I got a small PowerPole distribution block so I can not only connect the radio to the battery, but also the Genasun solar charge controller and whatever other power-related accessories I might use (e.g. Dakota Lithium's 5v USB charger which I've adapted to PowerPole). Solar-wise, the charge controller I went with has a little more capacity than what I'm using currently with the 75w panel. I figured I should bump up to the 10amp charge controller to allow for a larger solar panel later on.

Yaesu 857D portable kit shown from another angle. A closeup of the CW relocation cable is shown. The cable comes out the top of the bag, and is threaded down through the loops of the PALS webbing on the radio pouch.

For CW operation I've relocated the jack with a basic 3.5mm audio extension cable going up through the bag and looped through the PALS webbing on the High Ground Gear PRC-117G bag. For a key I'm usually packing a basic 3d-printed iambic paddle I got at a swap

meet for $20. I'd love a N0SA SP4 paddle but… $$$ :'D

In the following photos you can see how I've laid out the relocation cables. I specifically took photos of these to show people who want to re-create this kit, because it was pretty tedious to get it all in there. Hopefully these will save someone a bit of time. ;)

The back of the 857D is shown. The RF outputs have SO239-to-BNC right-angle adapters, and then there are right-angle BNC cables going from the back of the radio, across the top of it, and up to the BNC bulkhead connectors attached to the top/front of the pack frame. Thinner coiled cables attach the transceiver's serial and line-out ports to the Digirig, however these cables run along the underside of the transceiver, as the Digirig is on the opposite side of the radio. The front of the 857D is shown from above. The two BNC bulkhead connectors mounted to the pack frame are shown, with the BNC-terminated coax cables connected. The CW relocation cable can be seen dangling to the side.

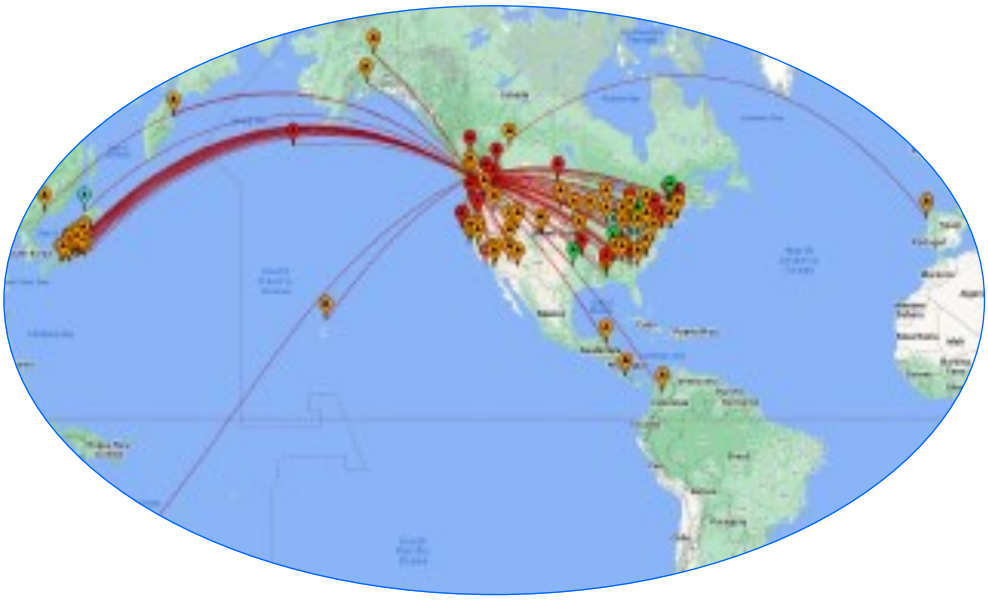
All in all, this kit weighs in at 11 pounds. It's a *bit* heavy to carry for a SOTA activation, but for POTA it's no problem at all. I have indeed carried it up to a SOTA summit, but HF propagation conditions were poor and I was really struggling to make any contacts. Ended up resorting to activating on 2m with a tape measure yagi. ;)

Because of the PALS webbing on the PRC-117G bag, this portable kit could be strapped to a larger backpack as needed, though typically I have just carried the kit *inside* my backpack, to keep the weight closer to my body. Perhaps more notably, additional accessory pouches could be attached, like a pouch for logbook/pencil/antennas/CW key etc.

## Conclusion

So how is this kit to actually use? In a word, awesome. Drop it on the ground or on a table, deploy and attach an antenna, turn on the power. If I'm expecting to be on air for a long time, I can attach the solar charge controller and solar panel to keep the station running (though I have yet to do this while operating, since I completed this kit very recently). I can go out into the field and use this setup indefinitely, regardless of available electrical infrastructure.

For digital operations, I have a ToughBook CF-31 which is fully configured with all relevant software I'd typically use. This is great for tossing in the vehicle for a POTA activation, and even feasible for SOTA if you're in great shape or willing to carry the



extra weight. An alternative for digital ops could be a lightweight single-board-computer, tablet, or netbook, of course.

Just for fun, here's a map of most of the QSOs I've made with this rig since putting it together. It's not exhaustive, but what I could quickly gather up for this post. 133 contacts across 11 countries. The furthest contact thus far is with VK2WN on 30m FT8, at a nice 11965km (7435mi) distance, with just 5watts of output power on my side. Nice!

Above is a world map showing many targets indicating successful radio contacts. Pins are connected via lines, from a central point (my home grid square) to all the remote stations all over the world.

If you have any questions about this kit or would like additional details, please feel free to reach out. I'd also be curious to hear from anyone who follows this build and creates their own variation!

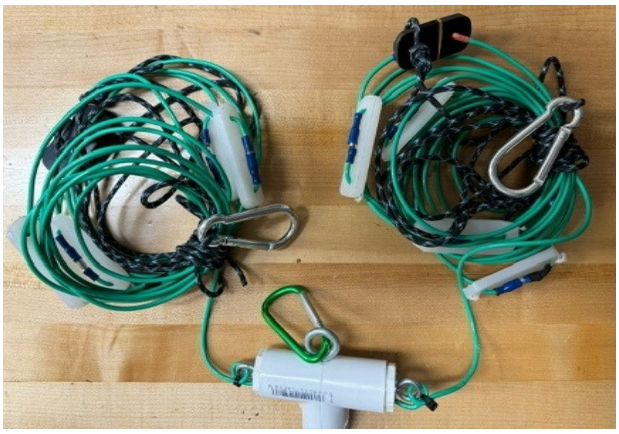
*~ 73 de VA7EKA*

## SARC Trello site

What is Trello? According to their website, Trello is the visual tool that empowers a team to manage any type of project, workflow, or task tracking.

We recently launched a Trello site managed by Reg VA7ZEB to receive ideas and to permit our members to see some of the issues and ideas that we are discussing.

You can visit the site at: ve7sar.net/brainstorm



# Antenna Adventures

# The multi-band linked antenna revisited

## Optimizing portable communications with linked dipole POTA & SOTA Antennas

by JOHN SCHOUTEN VE7TI

**John Schouten VE7TI** is active on HF, 2m and 70cm.

In the September-October issue of The Communicator I wrote an article about Dino VE7NX's linked dipole antenna. This remarkably simple antenna is so simple to build, yet produces remarkable results. I've been using and experimenting with this antenna since the last issue and can follow-up on the original article with some observations. First, a review of the linked dipole antenna.

Amateur radio operators, particularly those involved in Summits and Parks on the Air (POTA/SOTA) expeditions, face the challenge of maintaining effective communication in remote and sometimes rocky, elevated terrains. In such scenarios, portable antennas that are easy to deploy and capable of delivering exceptional performance are indispensable. One such antenna design that has gained popularity in this community is the Linked Dipole antenna. In this follow-up article, we will further delve into the intricacies of Linked Dipole SOTA antennas, exploring their design, construction, and operational advantages.

### Linked Dipole Antenna Basics

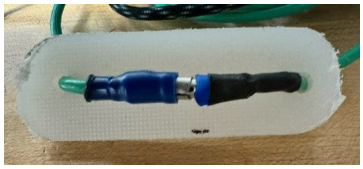
Linked Dipole antennas are essentially a variation of the traditional half-wave dipole antenna. What distinguishes them is the ability to adjust the antenna's length by "linking" or "unlinking" segments. By adding or removing elements, you can tune the antenna to different frequencies, making it highly versatile for multi-band operation.

## Design and Construction

### Elements

A standard Linked Dipole antenna typically consists of two half-wave elements, each cut to a specific frequency band. These elements are made from conductive materials such as copper wire and are often supported by lightweight, non-conductive mast material. I have tried both 18 gauge and 10 gauge wire. The thicker wire produces greater bandwidth for each band but the weight differences are significant if you are backpacking.

### Links



To make the antenna resonant at different bands, links are strategically placed along the elements. These links enable the operator to add or remove segments, effectively changing the antenna's length and resonance. I have used both 'bullet' connectors and spade lugs; both work well. For the insulators I 'borrowed' one of my wife's nylon cutting boards, which cut easily on a saw.

### Balun and Connector

A balun (balanced-to-unbalanced transformer) can be used to feed the antenna. A connector, often an SO-239 or BNC connector, is attached to facilitate easy connection to the radio. I find that the antenna works well even without a balun but a balun should reduce RF coming back on the feedline. Several clamp-on ferrites work well.

## Operational Advantages

Linked Dipole POTA/SOTA antennas offer several significant operational advantages:

### Multi-Band Capability

With carefully designed and placed links, a single Linked Dipole antenna can cover multiple bands, making it a cost-effective and space-saving choice for portable operations.

### Compact and Lightweight

These antennas are highly portable and easy to transport to elevated locations, a key consideration for POTA/SOTA activations.

### Easy Deployment

Setting up a Linked Dipole is straightforward, and the ability to adjust resonance without the need for tuning devices simplifies deployment and operation. I have tried a straight dipole as low as 15 feet off the ground with decent results and contacts throughout North America.

## Considerations for POTA/SOTA Activations

### Mast and Support

Lightweight mast systems, such as telescopic fishing or painter's poles, are ideal for supporting Linked Dipole antennas. Ensure a secure and stable guyed support structure, especially in windy conditions.

### Weather Resistance

Being designed for portable operations, these antennas should be constructed with weather-resistant materials to withstand various environmental conditions.

### Cable Management

Proper cable management, including the use of strain relief, helps prevent damage to the antenna elements and connectors during setup and takedown.

Linked Dipole antennas are a valuable asset for amateur radio operators engaged in portable activations. Their versatility, portability, and enhanced performance make them a popular

choice for communications in challenging terrains. By understanding the design principles and considering operational best practices, radio enthusiasts can make the most of these antennas, ensuring reliable communication while conquering the summits.

### Performance

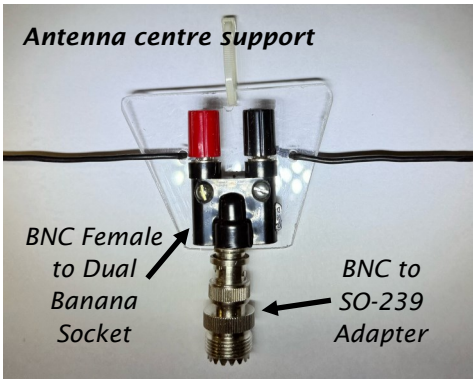
The performance of a Linked Dipole SOTA antenna, whether it's configured as a straight dipole or an inverted V, depends on various factors, including the terrain, the height above the ground, and the specific frequencies you intend to operate on. Both configurations have their advantages and may perform better in different situations. Let's explore the differences and considerations for each configuration:

## ***Straight Dipole***

### Advantages

A straight dipole is typically easier to deploy in open spaces with enough horizontal clearance.

It may have a lower take-off angle for radiation, which can be beneficial for long-distance communication.




Straight dipoles can be more predictable in terms of radiation patterns, especially when elevated well above the ground.

### Considerations

It may require more horizontal space, which can be a limiting factor in densely vegetated or mountainous areas.

Deployment height is critical for its performance, and it may be challenging to elevate it to the ideal height in some locations.

## ***Inverted V***

### Advantages

The inverted V configuration is more forgiving in terms of height above the ground. As there is only a centre support to raise, it can be effectively deployed at lower heights compared to a straight dipole.

It can work well in locations with limited horizontal space, such as forested areas or areas with terrain obstacles.

Inverted V antennas can offer a more omnidirectional radiation pattern, which can be advantageous for shorter and medium-range communication.

### Considerations

The inverted V showed the best SWR readings when the legs are about 120 degrees apart. It may have a slightly higher take-off angle, which can reduce its effectiveness for long-distance communication.

It may have slightly lower gain compared to a straight dipole, but this can be negligible for many applications.

The choice between a straight dipole and an inverted V configuration for a Linked Dipole SOTA antenna depends on the specific operating conditions and objectives. Here are some considerations to help you decide…

Space Availability: If you have ample horizontal space and can elevate the antenna to an optimal height, a straight dipole may be a good

Height Limitations: In situations where you cannot achieve the ideal height, the inverted V is a more forgiving option and can still provide effective performance.

Operating Range: Consider the distance you intend to communicate. For long-distance DX contacts, a straight dipole might be preferable, while an inverted V is suitable for more omnidirectional coverage.

Terrain and Obstacles: If you are operating in a densely vegetated or hilly area, the inverted V may be easier to deploy effectively.

Ultimately, both configurations have their merits, and the choice should be based on the specific circumstances of your SOTA activation. Experimenting with both configurations in different locations can help you determine which one works best for your needs.

*~ John VE7TI*

*You may also wish to check out this YouTube video by KH6JRM*

# A recommended POTA/SOTA antenna design website

I'd like to recommend an antenna design website provided by SOTA-Antennas [https://www.sota-antennas.com/linkd.php]. The site provides a guide to creating not only a linked dipole antenna, but also Off-Centre Fed dipoles (OCF), End-Fed Half-Wave (EFHW), Delta Loop and Half-Square designs.

In the upper right portion of the page is a graphics area where the modelled antenna is presented in a 3D context. The graphic can be zoomed, panned and rotated. Antenna feed-points are shown as colored markers; the user may also choose to toggle the appearance of a semi-transparent plane at the height (1.85 meters) of an average person, in order to gain some perspective on how large the antenna would be when erected.

In the lower half of each of the designers, a group of controls enable the calculation of an antenna's performance, and the presentation of charts and diagrams showing the performance in various ways, in any combination of the following:

- azimuth, elevation and 3D propagation charts
- VSWR charts, incorporating Real- and Imaginary-reactance curves
- an antenna currents diagram
- a Smith chart

Calculation of an antenna's performance is achieved using a version of the NEC2 (Numerical Electromagnetics Code v.2) code. Results of calculations, and the resulting charts and diagrams, have been compared with those presented by programs such as EZNec and 4nec2, for similar antennas, and have been found to be closely comparable. While SOTA makes NO claims as to the accuracy of this information or results; the graphics and data presented in this site are provided 'as-is" for the general interest and edification of the user.

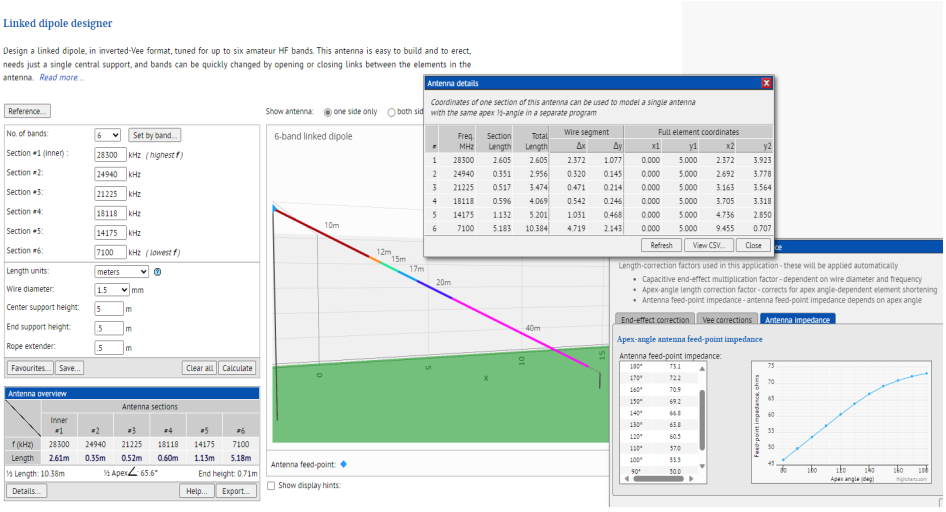
**Linked dipole designer**

The linked dipole antenna designer page enables the user to very quickly design a multi-band linked dipole antenna for portable use in the field, or on a mountain top.

This type of antenna is constructed with one or more sections in series, each for a particular amateur radio band, and which are capable of being Linked, or unlinked, as required, to make the antenna resonant on whichever band the radio operator wishes to use. Linking or unlinking sections has, however, the downside of having to lower the antenna to physically reach the very highest links.

Linked dipole antennas are especially easy to erect, requiring just one support in the center as an 'Inverted Vee'- this could be a pole or a cord suspended from a tree, and have the added benefit of giving good results even when erected in thick forest, since the antenna radiates horizontally polarized, while the trees present little obstacle since they are not only physically, but also electrically vertical. So the trees have little influence on the radiated signal. It is therefore good for heavily-forested POTA and SOTA summits.

*~ Thanks to Kevin VE7ZD for the link.*


Linked dipole designer
Design a linked dipole, in inverted-Vee format, tuned for up to six amateur HF bands. This antenna is easy to build and to erect, needs just a single central support, and bands can be quickly changed by opening or closing links between the elements in the antenna. Read more...
Reference...
No. of bands:
Set by band...
Section #1 (inner) :
Section #2:
Section #3:
Section #4:
Section #5:
Section #6:
Length units:
Wire diameter:
Center support height:
End support height:
Rope extender:
Favourites...
Save...
Clear all
Calculate
Antenna overview
Antenna sections
Details...
Help...
Export...
Show antenna:
one side only
6-band linked dipole
Antenna details
Coordinates of one section of this antenna can be used to model a single antenna with the same apex ½-angle in a separate program
Refresh
View CSV...
Close
Length-correction factors used in this application - these will be applied automatically
End-effect correction
Vee corrections
Antenna impedance
Apex-angle antenna feed-point impedance
Antenna feed-point impedance:
Show display hints:

# About AREDN

AREDN for amateur radio is a high-speed data network that uses wireless mesh technology to connect amateur radio operators and emergency communications infrastructure. AREDN is based on commercial off-the-shelf hardware that has been modified to operate on amateur radio frequencies.

AREDN nodes are self-configuring and self-healing, meaning they automatically find the best routes to deliver data packets across the network. AREDN nodes can also support various applications and services, such as video streaming, voice over IP, computer aided dispatch, incident response and mapping, asset management and monitoring, and more.

AREDN networks are independent of the Internet and can provide local communication solutions in case of disasters or emergencies. AREDN networks are also useful for civic events, such as hamfests, bike races, marathons, etc.

In SW British Columbia, the Nanaimo Amateur Radio Association operates an AREDN mid-Island AREDN Local Mid Island – Nanaimo Amateur Radio Association (ve7na.ca)

Other informative links:

https://www.arednmesh.org/

https://www.arednmesh.org/content/what-aredn-network

AREDN | Mid-Atlantic Wireless Communications Group, inc (mawcg.org)

https://k4pyr.com/wp-content/uploads/2021/05/AREDN_Beginners_Guide-v8.pdf

~

## *A Unique Radio Club Buildathon*

If your club is looking for something new, versus just another meeting, I encourage them to consider holding a Buildaton.

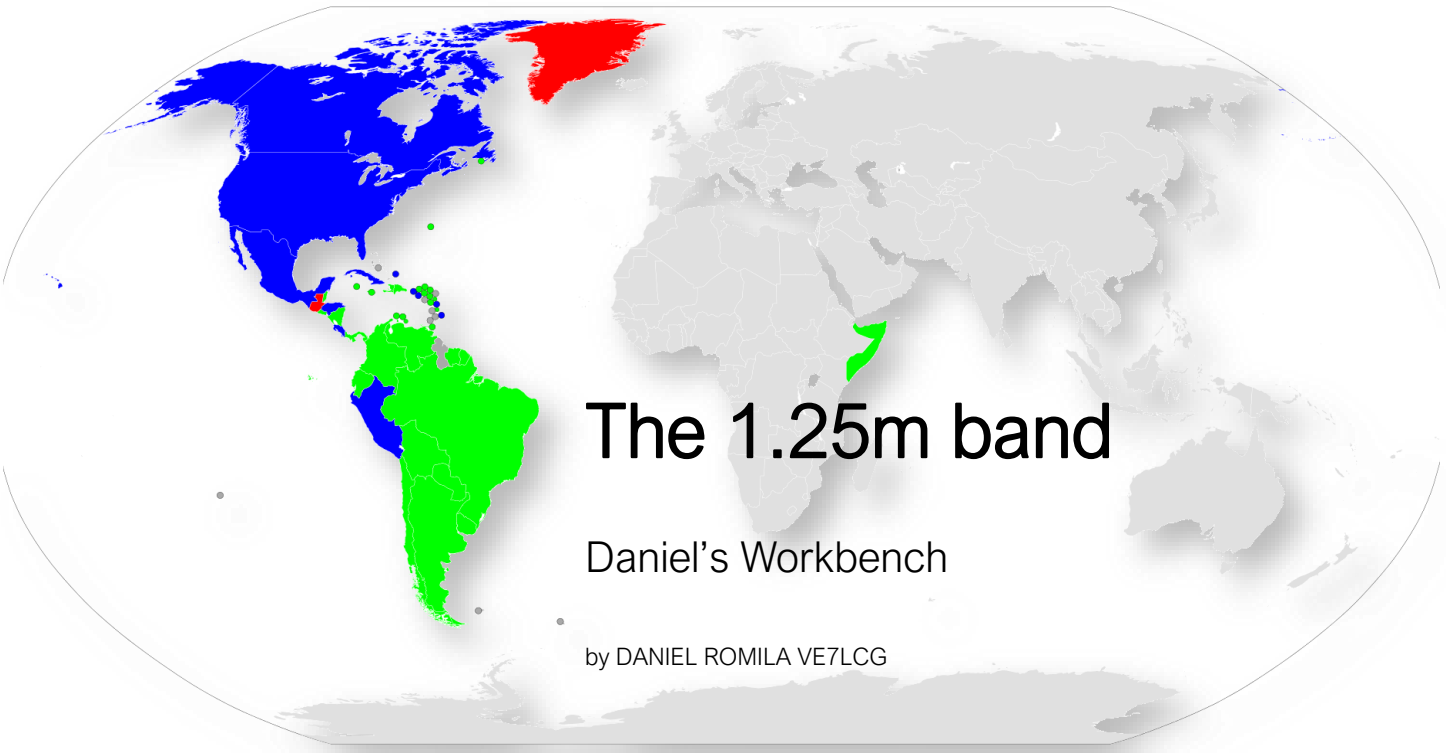
While a club Buildathon is nothing new, and many clubs have had them within our ARRL Section and beyond, the one hosted by Cowtown Amateur Radio Club (CARC) of Fort Worth, Texas, was successful because it provided members with something they could get their hands on, interact with, and continue to enjoy.

Watch the YouTube video, "ADX-Digital Transceiver - Cowtown ARC Buildathon Success!," by Richard, W5ARH, to learn more about the ADX digital mode transceiver designed by Barbaros Asuroglu, WB2CBA, that CARC members built, and how your club might do the same or something like it.

CARC President Dave Martin, K5YFO, stated that this Buildathon was successful because of the impressive support by Richard, W5ARH, and Barbaros, WB2CBA; it promoted on-the-air activity for all licensed members; it offered comradery; it was fun, exciting, and inexpensive (less than $35 per participant), and it was a practical and useful transceiver that members can use and enjoy.

The video can be viewed at https://youtu.be/VrkioM_xv6s.

*~ Dave Martin, K5YFO*



# The 1.25m band

## Daniel's Workbench

by DANIEL ROMILA VE7LCG

**Daniel Romila VE7LCG** is constantly experimenting with electronics and radio. Here he looks at the 1.2m band around the world.

In the United States and Canada, the band is available on a primary basis from 222 to 225 MHz, with the addition of 219 to 220 MHz on a limited, secondary basis. On the right is the table for recommended usage of the band, according to https://www.rac.ca/220-mhz-135-cm-page/

There are limited areas in the world where the 220 MHz band is available for radio amateurs. Shown above, I found a map that gives a clear image of the radio amateur band allocation in the world on Wikipedia.

Green areas allocate the whole band. Blue areas allocate a portion of the band. Red areas are in ITU Region 2, but do not allocate the band.

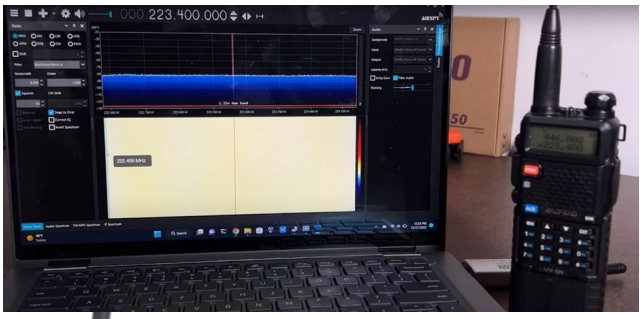
So, we (in the Americas) are pretty lonely having the right to use the 220 MHz band, which makes it more difficult buying transceivers for this band.

| | |
|---|---|
| 222.00 – 222.30 | CW, SSB |
| 222.00 – 222.05 | EME Exclusive |
| 222.05 – 222.10 | CW |
| 222.1 | National CW Calling Frequency |
| 222.10 – 222.275 | SSB |
| 222.2 | National SSB Calling Frequency |
| 222.275 – 222.30 | Propagation Beacons |
| 222.31 – 223.37 | Repeater Inputs |
| 223.390 – 223.490 | High Speed Data |
| *(Local option cross-band duplexed to 430 MHz, or 1300 MHz.)* | |
| 223.490 – 223.590 | FM Voice Simplex |
| 223.59 – 223.89 | Data |
| 223.592 – 223.69 | High Speed Data |
| *Local Option one 100 kHz channel, or three 30 kHz Channels: 223.605, 223.635 and 223.665* | |
| 223.685 – 223.805 | Narrow Band Packet |
| *4 channels, Max BW of 30 kHz each centered at 223.7, 223.73, 223.76 and 223.79* | |
| 223.790 – 223.890 | High Speed Data |
| *local option as 223.39 – 223.49* | |
| 223.91 – 225 | Repeater Outputs |

A Baofeng UV5R, having only the 144 MHz and 432 MHz band costs around $24 CAD in October 2023 (shipping and taxes included, from aliexpress.com). Many of those cheap Baofeng can be convinced (it seems they were actually designed to work in the 220 MHz band, too) with the programming software that can be found in many places on the Internet, like: https://mega.nz/file/qAAllRjI#kRQlINNBUfNdg4R1ZC5I_E7rARlbKOl6ckv65pZS39A

There is a video on YouTube describing in just several minutes how to do it:

https://www.youtube.com/watch?v=x4bVrM5TeEM



Maybe not all Baofeng UV5R handhelds can be unlocked; I did not try. Anyhow, the model that officially supports the 220 MHz is the Baofeng UV5R III.

It looks exactly the same as the base model, but it costs $40 CAD in October 2023 (shipping and taxes included).

In the same price range is the Baofeng model BF-A58S *[left]*.

Baofeng UV18h *[right]* is a more expensive model, $75 CAD (shipping and taxes included).

There are many walkie-talkies out there which have the 1.25 meters band. When buying such a handheld one should:

- Verify the 1.25 meter band contains the range of frequencies used in Canada
- If the transceiver can be programmed with CHIRP software (it's easy to obtain this information; and that it can retrieve local repeater data directly from the repeater book website; or at least whether there is any other programing software for it.

More power can be obtained with a mobile transceiver. The cheapest one I found online in October 2023 is QYT KT-8900R, 25 Watts, for around $100 CAD together with the programming cable (shipping and taxes included).

A dedicated transceiver only for 220 MHz, with a power of 50 Watts, such as a TYT TH9000D *[shown next page]*, would cost about $200 CAD in October 2023 (shipping and taxes included).

When I bought my first walkie-talkie in 2017, I went with a toy also capable of 220 MHz. If I could have survived these many years as an authorized radio amateur without a walkie-talkie, I would now buy a Yaesu knockoff, an MML UV-8DR. It is also known as Zastone UV-8DR, and under many other various names.

7.5 km West FM
**VE7RBY / Burnaby**
224.80000 -1.6 MHz 127.3 Hz

8.1 km North East FM IRLP Echolink
**VE7NZ / Coquitlam, Westwood Plateau**
224.92000 -1.6 MHz 114.8 Hz

15.7 km North FM AllStar
**VE7RPT / North Vancouver, Mount Seymour**
224.30000 -1.6 MHz 156.7 Hz

17.7 km West FM
**VE7NYE / Vancouver**
224.60000 -1.6 MHz 127.3 Hz

17.7 km West FM
**VE7RVK / Vancouver**
224.64000 -1.6 MHz

17.7 km West FM IRLP
**VE7RHS / Vancouver**
224.70000 -0.6 MHz

21.8 km East FM
**VE7RMR / Maple Ridge**
224.88000 -1.6 MHz

52.9 km East FM
**VE7RVA / Abbotsford, Sumas Mountain**
224.26000 -1.6 MHz 110.9 Hz

In 7 years, I made only one QSO on the 220 MHz band, but I periodically verify what repeaters are available on that band in a radius of about 200 kilometers and if I can reach those repeaters. The furthest away repeater I can reach nowadays on 220 MHz is W7ECG, from Bellingham WA, Lookout Mountain, 70.8 km South of my location. There used to be other repeaters, further away, but either they no longer function, changed their location and/or I cannot reach them anymore.

For those residing in the greater Vancouver area, here the repeaters in a 50 km radius from my location, as found in RepeaterBook *[above]*.

*~ Daniel VE7LCG*

*See also The Communicator March-April 2022 for further information about the 220 MHz band and its history.*

### *Demonstrating the FM capture effect*

Why aircraft still use AM. While FM is the standard modulation used for analogue voice communications, aircraft still use AM. Given that AM is more prone to interference, why is this the case? In this video I'll show you why.

YouTube: https://youtu.be/yHRDjhkrDbo?si=Z6g00SlyBHmVK2VE

...more from

# Tri-band dipole

## Mounted directly on the walkie-talkie

by DANIEL ROMILA VE7LCG

**Daniel Romila VE7LCG** built a triband dipole antenna and shares his results.

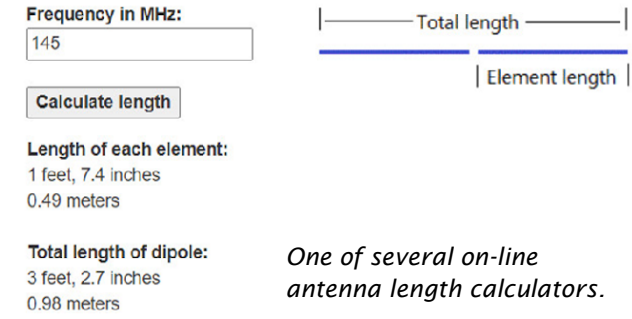
In 2022 I published an article called "Yes, I have a walkie-talkie, but I am not the security guard". Over there, in that humorous and less technical article, I was proposing a Frankenstein type of antenna to be installed on a walkie-talkie, in order for the radio amateur to clearly stand out from the crowd.

The triple dipole was made in a hurry, as a temporary prop to be photographed and to be the subject of a humorous article.

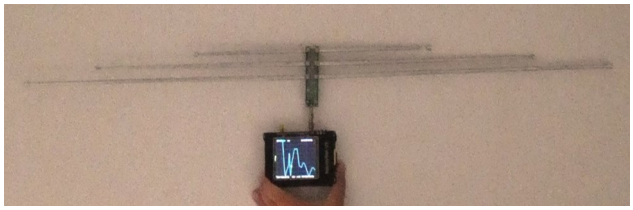
Nothing is more permanent than whatever is built with temporary intention. I found out that I really use the tri band dipole antenna installed directly on the walkie-talkie, and that it works very well. The lengths I used for the dipoles are those that resulted from an online calculator: https://www.66pacific.com/calculators/dipole-antenna-length-calculator.aspx

So, the lengths for 144 MHz – 220 MHz – 430 MHz bands are: 98 cm - 65 cm - 33 cm

The theoretical values matched the values obtained after adjustments made with a NanoVNA v2.

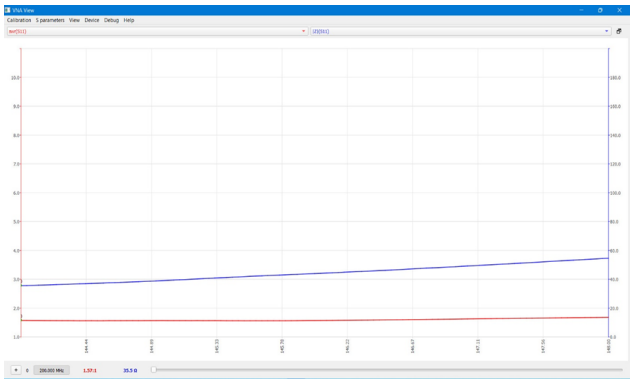



*One of several on-line antenna length calculators.*



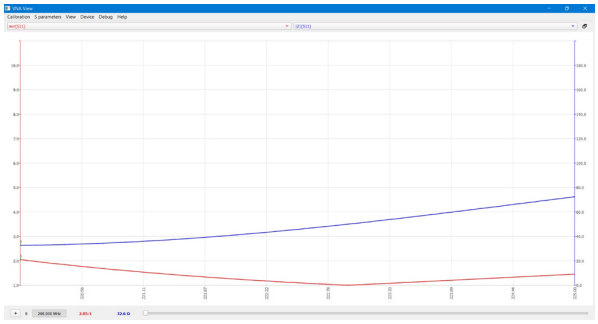
In the above picture NanoVNA v2 is set to sweep between 40 MHz and 500 MHz. While one cannot see many details in the above picture, it is still clear there are 3 deep valleys, for the 3 bands (the best SWR).

I repeat the final lengths are in fact the lengths I started with. Anyhow, because I used telescopic antennas, I started the adjustments with the longest dipole, the 144 MHz band one. I continued with the 220 MHz dipole and ended with the 430 MHz dipole. The idea was that the biggest dipole (s) might influence the smaller ones, being so close. I did not adapt anything to match impedance. Here are the details, obtained with a NanoVNA 2 tethered on a Windows PC running the program VNA QT 1.1 (August 2023).

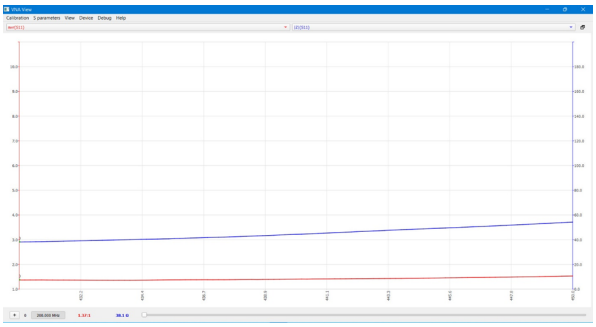


For the 144 MHz band SWR is consistently under 1.6 and the impedance varies between 38 Ohm and 58 Ohm.

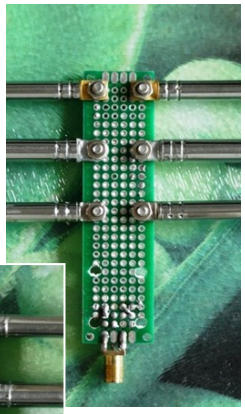
The 220 MHz had the most critical adjustment of all bands. The SWR is 2 at the start of the band, and I let it be, because the rest of the band – where the repeaters are – is much better. The impedance varies between 35 and 75 Ohm.

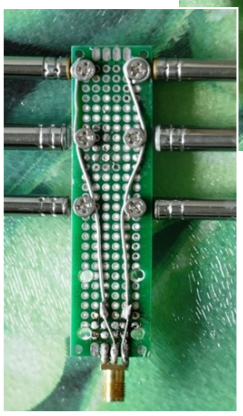


In the 430 MHz band the SWR is flat under 1.45 and the impedance has a smaller variation, between 39 Ohm and 56 Ohm.

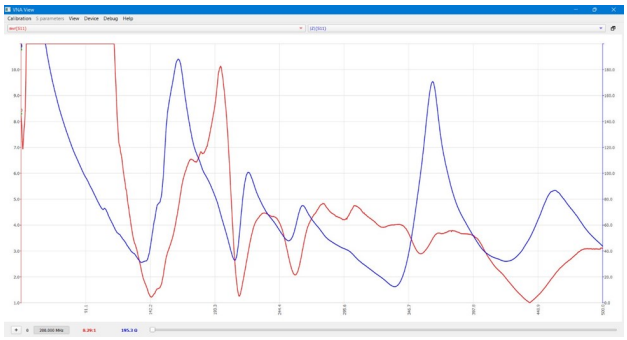


When used for horizontal polarization the dipoles are directional and one has to point towards the direction of the correspondent (eventually, the repeater). In a vertical position there is no directivity to take into consideration for terrestrial correspondents. I found it useful to use horizontal polarization, even if that is not appropriate for repeaters, in order to eliminate some noises at certain frequencies.





I built the antenna very fast, because I had no intention to keep it. I used a double-sided PCB, screws and telescopic antennas for the dipoles' arms.



One can use fixed length rods for the elements. The measurements are very dependent on the environment. In the third picture of the article, I showed the tri-dipole installed on the top of the NanoVNA v2 and what the screen of the instrument itself shows.

Tethering the NanoVNA v2 with a short USB cable, in the proximity of various objects, including my computer, modified it a little and showed tuning between 40 MHz and 500 MHz (not much, because I looked for a good position to take the pictures necessary for this article). I used 1001 points in the VNA QT program.

The tri-dipole is useful for a tri-band handheld, like a UV8-DR made by various manufacturers (either the original Yaesu, or knock-offs, like MML).

*~ Daniel VE7LCG*

## *QCX Rig by Don VE3IDS*

In 2017 a new QRP rig in kit form appeared and was an immediate hit. It is called the QCX. It was designed, kitted and sold by QRP Labs aka Hans Summers G0UPL. Since then, it has been superseded by the QCX+ and the QCX mini. They are single band 5 watt CW only rigs with full band coverage, digital display, built in memory keyer, dual VFOs, built in alignment equipment, 200 Hz filter with no ringing, a super hot receiver, a receive and transmit CW decoder that actually works, and many more features for $55 USD. An amazing bargain.

To date there have been more than 20,000 kits sold. I built my first one, a QCX original version and housed it in a canned ham tin for fun. It is my true "ham radio" I have built two QCX+ rigs for a friend recently. If you are wanting to try your hand at building, this is a good choice. The build and operating manuals are amazing. They are full colour and step by step and put the Heathkit manuals to shame and they were really good! Hans sells nice aluminum cases to fit them at a really good price as well.

*~ From FEEDBACK The Official Newsletter of the Georgian Bay Amateur Radio Club*

…more from

Daniel's Workbench

# Multi Tester T7

## Multiple test instruments in one package

by DANIEL ROMILA VE7LCG

**Daniel Romila VE7LCG** provides you with an evaluation of an inexpensive component tester.

This article is mostly a follow up to the nice article published in The Communicator, the September-October 2023 edition, at page 32 and signed by Gerry.

The T7 multi-function tester is useful for testing transistors, diodes, capacitors, inductances, capacitors, decoding remote infrared codes and several other functions.

Gerry complained that for small inductances the tester is fooled and sees the inductor as just a resistor, which is true for everything under 10 microH, according to the specifications.

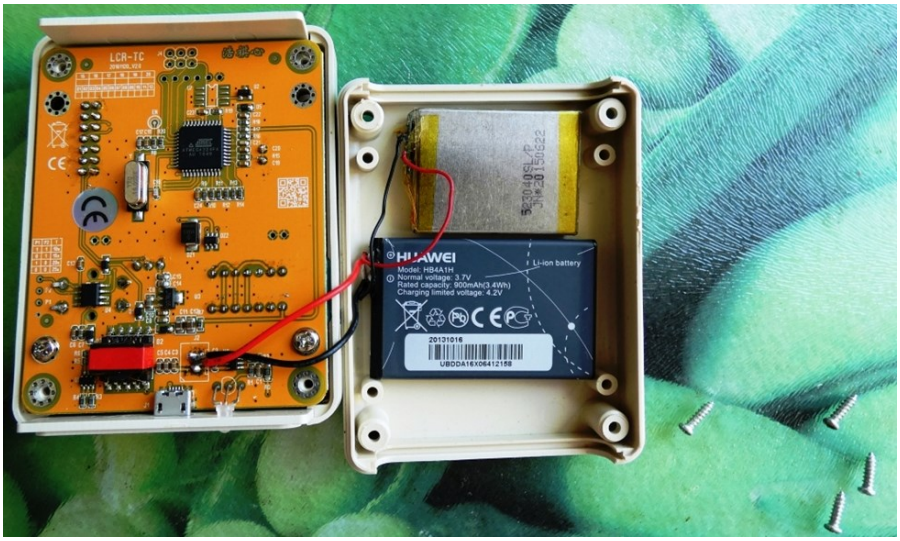
The complete user manual and specifications can be found at:

file:///D:/Datasheets/_Modules/JT-LCR-T7_Manual_2022-03-14.pdf

In September 2023 the T7 tester could be bought for $19 CAD, shipping and taxes included, from various vendors on aliexpress.com. In other currencies, $19 CAD = 13 EURO = $14 USD = 11 UK Lira = 264 ZAR.

As with every piece of nice new equipment you buy, the first thing to do is to tear it apart to see what is inside (this is mostly why you buy toys, isn't it? Or not "mostly", but the only reason?).

It is absolutely safe to unsolder and remove the LiPo battery that comes inside this tester, and throw it in the garbage, or keep it for less informed consumers, because this LiPo battery is in no way adequate for the high consumption of the T7 multi tester. As you can see in the following picture, I replaced the original battery with a cellphone battery, in parallel with whatever other good, higher capacity LiPo, I found in my drawer.




While you still have the tester open you should admire the microcontroller and the good quality of the circuitry. Glue the new battery/batteries on the back lid and screw in the 4 screws – but only after verifying it still works. I did not have any problem, but the wires are thin; if it does not work suspect the wires and soldering, not that you've damaged it.

There are many reviews of this product on YouTube, including a 14 minute video: https://www.youtube.com/watch?v=kboKDcvDVmM

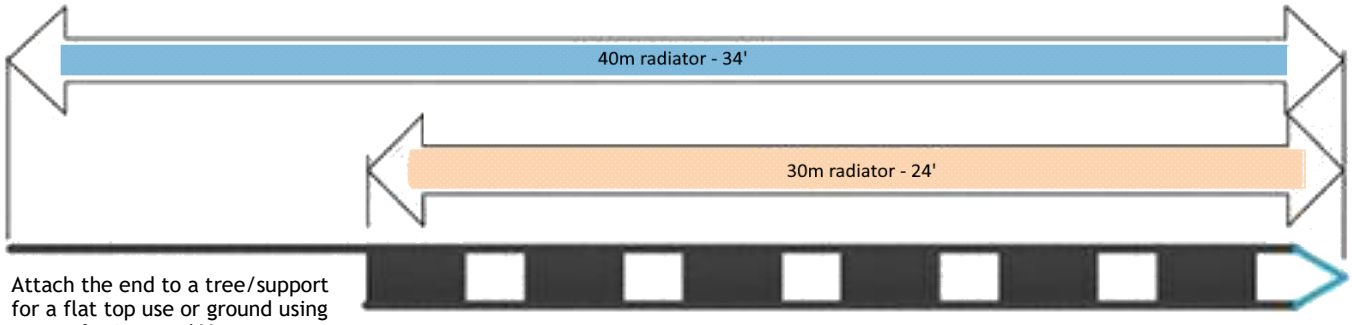
The microcontroller has a Pulse Width Modulation function as part of its program, carried over from the older TC1 tester. I do not know if the 2023 models still have it, and using the PWM is not intended for the normal user. I tried to find the YouTube video describing the PWM generator function again, but I could not find it anymore.

The infrared code decoding function is explained in the user manual that can be found at the given link at the start of this article, and in many other places.

*~ Daniel VE7LCG*

## *Ladder Line Antenna Mike VE3MKX*

A dual band HF wire antenna made from ladder line where you have one of the balanced wires for one band and another for a higher band below it. You simply measure and get the 2 wires of proper length. Similar to the images below. Then plug it right into the back of your open wire terminals of your tuner. There, of course are options to connect to the feedline and tuner, via a balun or choke. Whatever you decide on, this should make a lightweight option for POTA or portable operations. *~ From FEEDBACK The Official Newsletter of the Georgian Bay Amateur Radio Club*




Attach the end to a tree/support for a flat top use or ground using a rope for inverted V

Attach to center conductor or braid of Coax and attach the other identical leg to the remaining conductor

…more from

Daniel's Workbench

# Calibration of VFO made with Si5351

## Striving for greater accuracy

by DANIEL ROMILA VE7LCG

**Daniel Romila VE7LCG** evaluates and experiments with a Si5351 VFO.

There are many programs written for ARDUINO boards handling a Si5351 VFO and digitally displaying the frequency. Many hobbyists buy the components, load the programs and are surprised their VFO works, but the frequency is not exactly spot-on as displayed by their project.

Whatever Arduino program is used, one should look in it for the line:

```
si5351.set_correction(121000); // This is the correction for the Si5351 module I used.
```

The command for setting the correction for a particular Si5351 is *si5351.set_correction ()*. Inside the parenthesis there must be a six digit number.

In some programs, it is also possible the author to use:

```
si5351.init (SI5351_CRYSTAL_LOAD_8PF, 0, corr);
```

where corr was defined in a line like:

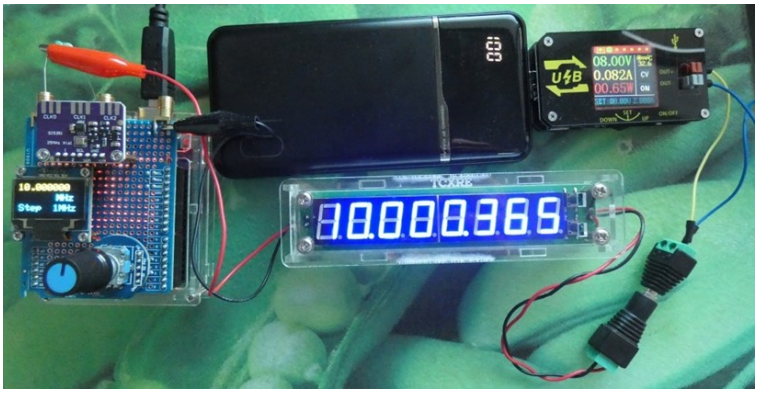
```
int corr = 0; // this is the correction factor for the Si5351, use the calibration sketch to find the value.
```

Anyhow, one must get the six digits of the correction number for the VFO to output the best frequency precision/accuracy. Luckily, there is a simple and short procedure offered by Paul Warren and Jason Milldrum many years ago. It is so good that it is still the best.

Starting example: I replicated my own project, I loaded my own code that already worked - see the schematic, code and library at: https://github.com/danielromila/VFO-10-KHz-160-MHz YouTube video

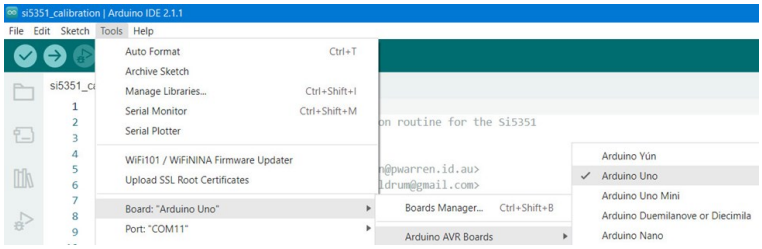
(1 min 31 sec): https://www.youtube.com/watch?v=7KEPbQaxyXg

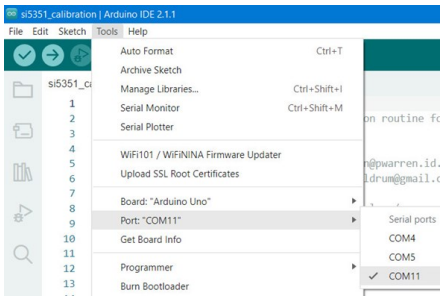
I tried to output 10 MHz, and I obtained 365 Hz above the correct frequency.



This happened because the Arduino program I loaded had the correction value for an old Si5351 module that I used a long time ago, in a different project. Let's find the correction value for my new Si5351 module. I recommend starting the procedure with absolutely no library in the Arduino libraries folder. There will be a warning note again at the end of the tutorial.

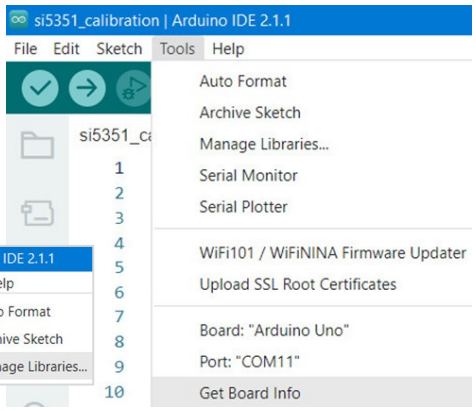
I started the ARDUINO IDE program, and I selected my board to work with, which in my case is an Arduino UNO (please select your board, if different).



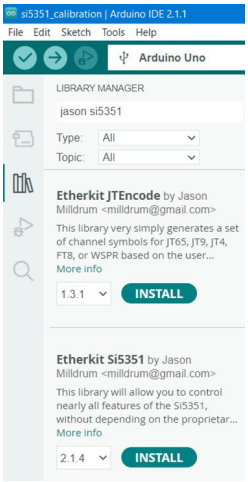




I also selected the COM port, that means the USB port on my computer where my board is connected. To be honest, I just tried what I was offered as choices by Arduino IDE, and COM 11 worked for me.

To verify that I got it right in the above two steps, I asked for "board info"

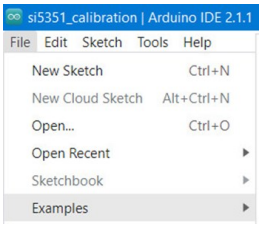



In order to find the six digit correction number I had to install the library made by Jason Milldrum. Start the library manager:

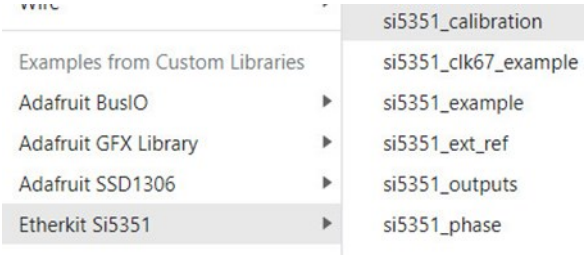

si5351_calibration | Arduino IDE 2.1.1
File Edit Sketch Tools Help
Arduino Uno
LIBRARY MANAGER
jason si5351
Type: All
Topic: All
Etherkit JTEncode by Jason Milldrum <milldrum@gmail.com>
This library very simply generates a set of channel symbols for JT65, JT9, JT4, FT8, or WSPR based on the user...
More info
1.3.1
INSTALL
Etherkit Si5351 by Jason Milldrum <milldrum@gmail.com>
This library will allow you to control nearly all features of the Si5351, without depending on the proprietar...
More info
2.1.4
INSTALL

In the newly opened menu, write (up) "jason si5351" and one of the offered results is Etherkit Si5351 by Jason Milldrum. Click INSTAll *[see right*].

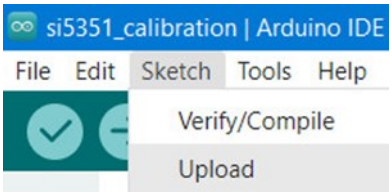
Now we can open in Arduino IDE an example, specially made by Jason, for calibration *[see right].*



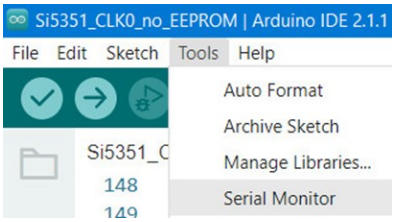

Somewhere very far down in the examples is our file:



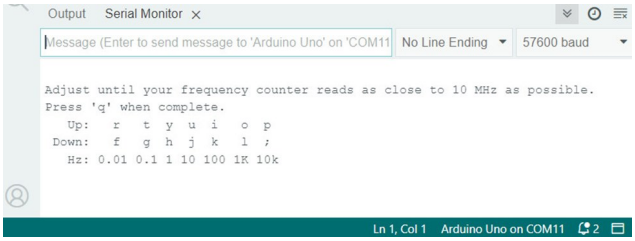
Upload the sketch.




Open the serial monitor.

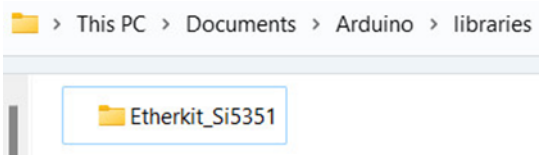



The correct window to obtain is this:


Output Serial Monitor
Message (Enter to send message to 'Arduino Uno' on 'COM11'
No Line Ending
57600 baud
Adjust until your frequency counter reads as close to 10 MHz as possible.
Press 'q' when complete.
Up: r t y u i o p
Down: f g h j k l ;
Hz: 0.01 0.1 1 10 100 1K 10k
Ln 1, Col 1 Arduino Uno on COM11

Most probably you will not obtain this window, but some garbage writing that cannot be understood. This is because your communication speed is not set to 57600 baud. See the right upper corner in above picture. Set the right speed, and open the serial monitor again.

*NOTE: If somehow you could not obtain the correct window and there is no display there, that means you had other libraries in the Arduino libraries folder. I allow only one library there, that's the one we just installed in this example – yeah, it happened to me, too (LOL).*




In the meantime, my Si5351 module is warmed up, it does not have any correction number in it, and now I see that instead of getting 10 MHz in my new module, without any correction applied whatsoever, I have 1577 Hz above 10 MHz.

Looking into the serial monitor window, I see that if I want to go lower with 1KHz, I have to push "l", and ENTER. Yes, it worked, and is 1 KHz lower. I have to press k 5 times and ENTER afterwards, because I am 500 Hz above. Similarly for the tenths of Hz and for units of Hz. Now I see on my frequency meter that I am at exactly 10 MHz, I press q and ENTER. Somewhere in the serial monitor window there is the message:

Scroll down/up until you find it.

```
Calibration factor is 157560
```

Although I have a frequency meter that does not show digits under 1 Hz, I can play with sub 1 Hz corrections, to make the last 0 stable in the display, to prevent switching between 0 and 1.

Finished. Now you can go into your favorite VFO program (Arduino sketch), introduce the 6 digit correction number in the command(s) described at the very beginning of the article, and you'll have the maximum precision you can obtain from your Si5351 module.

*~ Daniel VE7LCG*

Daniel's Workbench

# Stabilized power

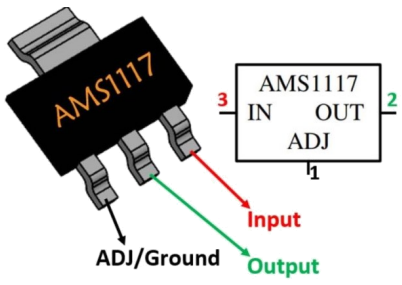
## Striving for greater accuracy

by DANIEL ROMILA VE7LCG

**Daniel Romila VE7LCG** with an overview of stabilizing your power supply

I use switching power supplies for power supplying my projects. They are cheap and efficient. Their size is smaller than the linear ones. They might radiate some radio frequency, but generally they are more than 0K for my requirements.

I still need to use linear power supplies on the boards themselves, for varicap diodes, oscillators and various integrated circuits which do not consume much, but either require further stabilizing and/or a smaller voltage than the whole project. I like very much the integrated linear stabilizers, which have 3 pins. I mostly use those with 3 pins: input, ground, output. They have fixed output voltage. Some of them have the adjustment pin instead of the ground pin - the ground is connected through the adjustment resistor(s).




Online I found cheap 3-pin linear stabilizers, and I could not stop myself, so I bought them. They are from the AMSI 117 series.

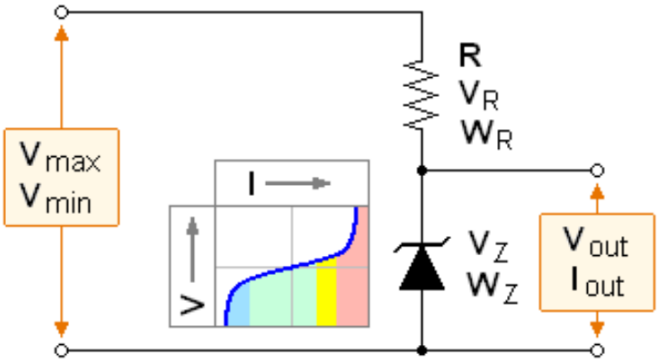
From: https://a2itronic.ma/product/ams1117-3-3v-1 a-regulateur-de-tension-sot-223/

I bought 3.3V, 5V and adjustable ones. Instead of AMSI 117 one can find the same integrated circuits with other names. I bought such devices because while they are designed to be surface mounted, they can also be put through the holes. There is on top a metallic surface which can be soldered to a bigger surface radiator, eventually the copper surface from the prototyping board itself. They are declared as allowing a 1 Amp current through them (http://www.advanced-monolithic.com/pdf/dsl 117.pdf) but such high values are not for normal functioning.

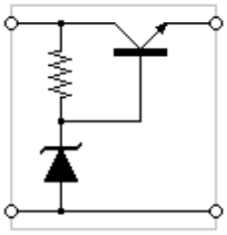
*So, the problem to be solved is to use those integrated circuits as linear stabilizers for power*

*stabilizers supplying more power than the integrated circuits alone can.*

If you remember, the same problem hobbyists had with Zener diodes, and they added a power transistor:



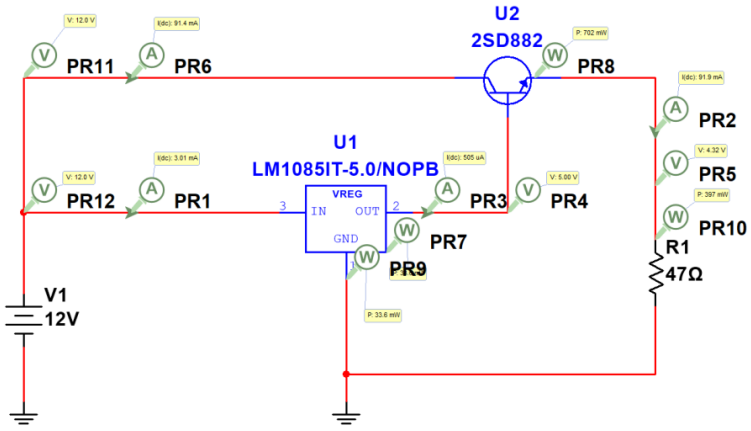

From: [https://www.claredot.net/en/sec-Electronics/zener-voltage-regulator.php](https://www.claredot.net/en/sec-Electronics/zener-voltage-regulator.php)



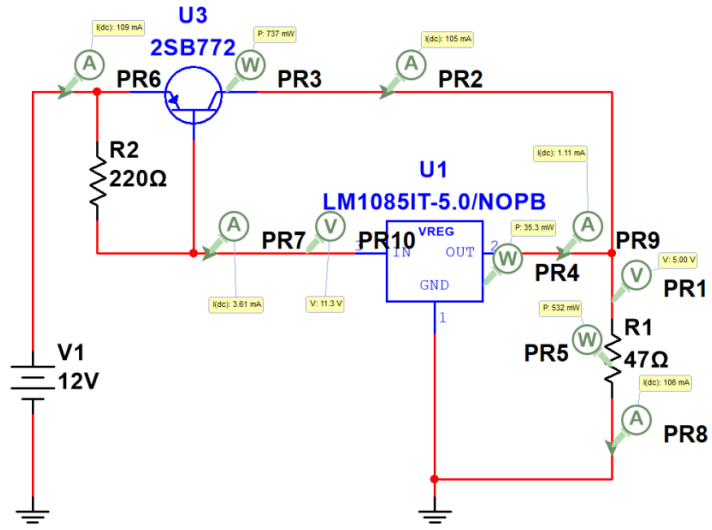
You immediately notice the stabilizing element, the Zener diode, is no longer connected to the output of the linear voltage stabilizer; it is in series with the Base-Emitter junction of the npn power transistor. The transistor junction is known to have a 0.65 Volt drop, and the actual voltage is very dependent on temperature and the current that passes through the transistor. In other words, the output voltage after the transistor is less stabilized than at the Zener diode pins.

The same happens with the 3-pin integrated circuits, if an npn power transistor is used to take the power load in it and protect the integrated circuit. I drew myself the schematic and simulated it in Multisim 14.3 *[above right]*.

You will notice in the above schematic that I want to obtain some 5 Volt from 12 Volt on a relatively small load (47 Ohms), which would consume some 90 mA. The transistor itself consumes and radiates 0.7 Wats, while the integrated circuit is at a lower stress, just 33.6 mWatts.




The schematic is simple, but one of the problems is that I do not obtain 5 Volts at the output, but 4.32 Volt, and no longer as stabilized as the 5V IC is capable of. The solution is to arrange a different schematic, with a pnp transistor. The drawing and simulation are also done by me in Multisim 14.3.




This time I indeed obtain 5 Volts at the output. The current going through the integrated circuit is only 1.11 mA, while the big stress is taken by the pnp transistor, 105 mA. The power radiated by the IC and by the transistor are similar to the previous schematic (737 mWatt for the transistor and 36.3 mWatt for the IC), but the output stability is now dictated

by the performance of the 3-pin integrated circuit stabilizer. For best performance, R2 assures the biasing for the transistor and also a normal value current through the IC (in the range of milliAmps, not microAmps as in the previous schematic) .

I did not invent those schematics and the solution was found by many other hobbyists before me. Computer Assisted Design allows radio amateurs to burn fewer devices and to start on practical soldering with a solution that already promises to work, so the improvement path is shorter and more efficient.

*~ Daniel VE7LCG*

# A cheap base station

## Using a TYT TH-9800 mobile transceiver

by DANIEL ROMILA VE7LCG

**Daniel Romila VE7LCG** has a new TYT mobile transceiver. Here is his in-depth review.

*Disclaimer: I am not connected to any seller. I am the kind of guy that takes cheap transceivers out of the box, installs all the cables, immediately puts it to use, and programs the memories, without even looking at the user manual. This comes with experience and works for me but might not work for you.*

About 5 years ago I was promoting using a walkie-talkie as a base station for participating in the weekly nets on the local repeaters. With some additional filtering in the charger cradle a handheld transceiver can stay there while in use (after mandatory verification that the supplementary filtering really works, and that the charger no longer gives a “hum” during transmission). Add an external hand microphone, a simple dipole antenna put on the wall, and you could get a comfortable, cheap base station for participating in the local radio amateur community.

Unfortunately, during a Friday net in which Reg VA7ZEB was net control, I found out the above solution does not work for me any longer. In the simplex part of the net, I had problems being heard from less than 5 kilometers away. This was

because in the five years that passed since I was promoting the cheap handheld as a modest base station, a lot of tall buildings were built everywhere. I started to have problems reaching repeaters even with 50 Watts, and my signal is distorted because of multiple reflections from the nearby buildings. I needed a new cheap and reliable multiband base transceiver, something with at least 50 Watts. After some research, the TYT TH-9800 was the model I decided to buy.

I live in a small one-bedroom apartment and the "radio shack" where I am allowed to keep the equipment that I often use is a corner desk. I can put equipment on the desk and on the shelves under the desk. That is all I have for the soldering station, transceivers and oscilloscope. My roommate still allows me – in her generosity (LOL) – to have electronic components in other drawers.

You can see the TH-9800 on the right corner of my desk in the picture *[top right]*. The TH-9800 is a quad band transceiver, with FM only Tx, and with AM and FM capability for Rx. No SSB. It is capable of the CB, 10 meter, 6 meter, 2 meter, 70 centimeter, and the FRS/GMRS bands. There is a special version which replaces the 70 centimeter band with the 1.25 meter band (220 MHz). Here is what my version of TH-9800, from 2023 is capable of:

| No. | Rx Lower | Rx Upper | Tx Lower | Tx Upper |
|---|---|---|---|---|
| 30M | 26.00000 | 33.00000 | 26.00000 | 33.00000 |
| 50M | 47.00000 | 54.00000 | 47.00000 | 54.00000 |
| 60M | | | | |
| 108M | 108.00000 | 133.99500 | | |
| 150M | 134.00000 | 180.00000 | 134.00000 | 174.00000 |
| 250M | | | | |
| 350M | 350.00000 | 399.99500 | | |
| 450M | 400.00000 | 512.00000 | 400.00000 | 480.00000 |
| 850M | 750.00000 | 950.00000 | | |

There are four selectable levels of powers: 5W – 10 W – 20W and 50 W (40W in the 70 centimeters band). This is what is claimed in the user manual, and I have strong reasons to suspect actual power is greater.

As you noticed from the transceiver front panel picture, TH-9800 has two sides, so actually there are two transceivers in one case (more precisely one transmitter and two receivers,

and the receivers both work at the same time; one needs to use the side's volume and squelch button to mute one receiver). It is capable of crossband repeating by simply activating an option in the menu.

I would like to start with two observations that are useful for any transceiver, not only the TYT TH-9800.

- If the specs say that during the transmission the current consumption is 8.5 Amps (specifically in the case of the TYT TH-9800), expect spikes of 10 to 15 Amps in consumption. That means the power supply must be strong enough for the transceiver that you eventually buy, and to be filtered adequately even when the consumption is so great.
- The manufacturers provide generously long cables for supplying power to your transceiver. Long cables always mean trouble. My TYT TH-9800 interfered with the charger of the walkie-talkie next to it (see the picture of my desk). Every time I pushed the Tx button, the walkie-talkie's charger LED became RED, and stayed there many minutes after. If you still do not feel like cutting the power cables shorter, just braid the two wires, as in the picture on the right. This totally eliminated all my Tx keying problems. It also eliminated any interference collected from the computer, monitor, Internet router and so on. You see how crowded my desk is, and all this equipment

is on at the same time as the TH-9800 transceiver. They are now all happy together.

- Program your transceiver with your computer and with the programming cable for your transceiver, but do not forget to disconnect the programming cable from the transceiver when you use the transceiver as Tx/Rx. The GND of your transceiver is not the same as the GND of your computer. For sure the computer has a switching power supply (supplies), and your power supply for the transceiver might also be a switching one, as mine is. A lot of "hum" will be introduced into your transmission from the computer if you forget the programming cable is connected. It happened to me.

My TYT TH-9800 transceiver is from 2023, and I suspect it has newer firmware than many previous TH-9800 had. This model has been around since 2014 or even earlier. People complained about many things with the TH-9800 during the intervening years. I found that everything people wanted changed in this transceiver were just settings in the transceiver's menu; the manufacturer satisfied the complainers and now all the default settings people wanted are indeed the default settings.

I was immediately able to reach repeaters more than 100 kilometers distant in the 6-meter and 2-meter bands. I received some distant 10 meters repeaters intermittently. I do not have any 10-meter repeaters within a 1,000 kilometer radius, and I did not want to force transmitting on the 70 centimeter band before having a proper antenna for it, and good SWR, but it worked OK on all local repeaters.

I preferred to do the programming with TYT's own program. The free CHIRP program is only experimental for this transceiver. What I did not like about programming with CHIRP is not the fault of TYT, but the fault of CHIRP. I wanted to import repeaters to program into the memories from repeaterbook.com with CHIRP, but the resulting import does not have all the data in the columns they are supposed to be. Maybe it works for the repeaters from your area, but for my repeaters of interest the imported data is a mess and cannot be used in any transceiver. Another big problem with CHIRP is that it filters the imported repeaters by country. I live close to the Canada – United States border. I find it funny that CHIRP asks me my latitude and longitude, and although I give the answer, it limits me to only one country.

The TYT program worked without any problem. The settings from the transceiver itself have priority over whatever you decide in the program. For example, the microphone has 4 programable keys, and whatever is user programmed into those keys must be kept from one radio session to another, otherwise it reverts back to default. From the multitude of options TYT TH-9800 gave me, I choose:

- P1 for switching between working memorized channels and free selectable frequencies.
- P2 for REVERSE; that means when I work a repeater, I can choose to directly hear other radio amateurs using the repeater via the repeater input, so that I hear their transmission, not what the repeater re-transmits.
- P3 for switching between the left or the right side of the transceiver as the primary one.
- P4 for selecting the four levels of Tx power, between 5 Watts and 50 Watts. I do suspect this power is above the specs.

The audio reception quality is good enough, because the speaker fires up and it is 4 centimeters in diameter. The transmission works in FM only and has 3 levels of maximum modulation deviation. As the default I set the one called WIDE in TYT terms. I verified the other ones, and they work, but my voice lacked range and lacked bass. I set the default emphasis option (ON), and the default of not using the compander. I listened to myself via EchoLink and there was no background noise once I unplugged the programming cable from the transceiver. I do not think I will switch off the computer/monitor, so my transmission must be clean with all the other equipment operating on the same desk. And indeed, the TYT TH9800 is up to the task. Not only did I verify that by hearing myself on EchoLink, but I also asked correspondents and they all said it is OK, once I had disconnected the programming cable (LOL). I thank VA7ISI and VE7CZV for their help through the VE7RSC Surrey repeater. VE7CZV told me there is some small background noise, and at that moment, I remembered I forgot to disconnect the USB programming cable (LOL).

The Tx seems to be tolerant of various antennas. The fan installed on the radio (boy, the

fan is so small, the radio is so big!) was making noise and rotating at fast speed. I was worried after about one hour of making contacts (LOL) on 50 MHz repeaters W7MBY, VE7RSX and K7OET with 50 Watts, at more than 100 kilometers, 5-9 both ways, when I noticed I had forgotten to connect the 50 MHz antenna, and I that I was still working with the 144 MHz antenna, which has up to 3.5 measured SWR on 50 MHz, as measured with a NanoVNA in the Windows QT program. My normal 50 MHz antenna is a telescopic antenna fixed on the balcony and tuned with a NanoVNA for maximum 1.5 SWR on the 6 meter band.

So, the TYT TH-9800 transceiver forgave even a not-so-great match on my antenna, and it did not shut off.

The sensitivity of TYT TH-9800 is claimed to be 0.2 uV, but I suspect it to be better than that. This is because it is a bit more sensitive than my old Kenwood 7950 transceiver in the 2-meter band (a Kenwood 7950 is single band on 2-meters). I just verified the tuning of the Kenwood 7950 and it was OK.

The front panel of TYT TH-9800 is detachable and a cable is provided for remote operation. I do not have a car; I do not intend to ever have a car, so I do not use this option.

I liked that the transceiver came with all the cables and brackets. I use the car bracket for keeping it on the desk, and I can adjust the angle in 3 mechanically fixed positions.

This transceiver is incredibly small and weighs only 1.2 kilograms. It is suitable use as a base station on the desk, next to a computer/ monitor that is also in operation. To help night operation, the microphone has a switch for turning the illumination of the keys ON/OFF. There is a headphone jack at the back of the transceiver. Like most transceivers, the headphones jack is MONO, which means that if you connect a normal headphone only the left side will have audio. Another thing I do not like about this transceiver (like the majority of transceivers) is that the audio out comes from a class D audio amplifier, which makes none of the two headphone output connections at ground. I bought some cheap headphones, with bigger active units in them (the headphone speakers), to not disturb my roommate and neighbors. I will cut the normal stereo connector of those headphones and I will solder in a MONO jack, to hear the same sound from the transceiver in both LEFT and RIGHT speakers of the headphones.

One complaint some users had about this transceiver is that one side can operate on only two bands, while the other side can operate on all frequencies. This creates confusion and many users contacted the vendor and manufacturer to return their "defective" TH-9800 transceivers. The user manual is in English and clearly describes the characteristics and all operations, including as a repeater.

After several hours of using this transceiver, I felt like it was always on my desk and that I had used it forever. I would like to again caution the reader that he/ she might not have as comfortable an experience with the TH-9800 as I've had. Several hours after getting it to my door I was giving advice through the VE7NWR repeater to people digitally connected from other countries who've had TYT equipment for years. If I am asked how to do something on my TH-9800 without having it in front of me, I do not know. But when I touch it, somehow, I enter the designer's mind, and I succeed in everything I want to do. Most likely there are transceivers from other manufacturers that would cause me a lot of problems learning to use them.

If you want a lot of transceiver, a lot of power (50 Watts), then this TYT TH-9800 is a good option to consider. One does need to see if he/she can get used to the menus and operating style, which is not suitable for everyone. A video showing manual programming, some simple settings and operation can be found at:

https://www.youtube.com/watch?v=TboouM-v1w4

*~ Daniel VE7LCG*

*For another opinion, check out eHam's TYT 9800 review.*

This quarterly journal has some steps to try

# Hunting QRM to Order!

by THE CONSTRUCTOR'S CLUB

**JOURNAL OF THE CONSTRUCTOR'S CLUB**

The "Hot Iron" newsletters were begun in 1993 by Tim Walford, G3PCJ and are currently produced by Peter Thornton G6NGR and Frank Barnes W4NPN.

The quarterly Issues cover a wide range of topics of interest to the Amateur Community.

Please send technical questions directly to Peter at this email address: equieng@gmail.com

That QRM is a right b*~~er, it drives you mad - it comes from (seemingly) everywhere; it is a relentless problem that's getting worse all the time. Sometimes a bit of methodical detective work can hush the gremlins; or maybe find a direction from which the noise is quietest. Try some - or all - the ideas below, which helped us when testing RF semiconductors.

Airborne, Earth borne or Wiring trouble?

QRM is RF noise; it can come from myriad sources - how do you find (and hopefully negate) the major culprits? Here are some simple checks that might help locate the QRM source.

**Does the QRM reduce if you try a Hertz (balanced) antenna, i.e. dipole or tuned loop?**

If the QRM reduces, and is lower in some direction(s) the QRM is inducing equal and opposite currents in each dipole or loop leg, so the noise signals are cancelling (hopefully). Hertz antennas are directional - sorry, MW / LF fans, you'll need some major real estate to do this down in the kHz!

**Does the QRM drop if you replace the antenna with a (non-inductive) 50 ohm resistor?**

The only way ANY signal can get into the receiver with a matched (and shielded) 50 ohm resistor across the antenna input is via the power supply or by signals getting into the outer skin of the metallic case / conducting screens of your receiver, or coming up the power supply / Earth lead(s).

**Are you using a Marconi (unbalanced) antenna? Does the QRM reduce if you disconnect the Earth rod and use a 'virtual' earth - like a counter-wound (non-inductive) counterpoise?**

You may have earth borne currents flowing in your area from other electrical installations nearby (and not so nearby - earth currents from distribution networks can travel many km's!).

**Does the QRM reduce if you use battery (or DC power supply)?**

I don't mean "hum" or related 50 / 60Hz noise, I'm referring to wideband noise, not power supply related. Though the dreaded 'direct conversion hum' is a killer, that is another issue entirely from HF QRM which I'll look at some other time.

Your receiver may be very sensitive to noise coming up the earth wire; the counterpoise (above) might indicate this too if the QRM significantly reduces.

**Disconnect your household electrical appliances one by one, see if the QRM drops**

Good behaviour begins at home - YOU might be the source of local QRM!

## Earth Noise: the insidious Demon

In most urban areas live other electrical equipment users; and **all** installations run currents into the earth, either deliberately or by induction or leakage. Remember you're seeking µvolts of RF!

Delta connected capacitors in the 'filter' mains input sockets or other 'noise elimination' schemes run capacitors line to earth, neutral to earth and line to neutral: all these contribute to noise currents in the earth. The 'true' earth of your supply is the 3Φstar point in the substation feeding your house via cables, usually (but not always!) steel wire armoured and these induce 50 / 60Hz currents in their screens. Being VLF, skin effect is not present to any real extent so can't contain the noise within the armouring; these currents despite magnetic steel armouring induce emf's in the nearby ground and said ground being wet and salty, it conducts well, so the currents can run for many metres through the ground.

Similarly, AC power is distributed over the network with non-linear over voltage 'Metrosils' , 'Transorbs' connected to absorb over-volt surges. These cut transients, thus, as Mr. Fourier's analysis tells, make for HF harmonics. It's common to 'tap change' transformers on load using ballast inductors to limit short circuit currents, but these inductors carry huge currents, and are rapidly switched in and out causing back emf surges (Lenz's Law).

To eliminate problems like this in industry, it's common for 'electrically' clean rooms in semiconductor test halls to use Earth free Faraday cages, where the AC power is fed into a conductive walled room via 230v to 230v isolating transformers with substantial line-to-line filtering, using Class X capacitors and heavy common mode chokes - as no Earth connection is allowed inside. I don't think a full Faraday cage in a domestic environment would be acceptable to your XYL(!!); ¾" wire netting lining can be an efficient RF screen in a garden shack. Faraday's law assures that charges can only exist on the **outside** of an enclosure, and that includes QRM.

The only route in for QRM is via mains wiring entering your Faraday cage - and if this is via isolating transformer(s) and substantial line filtering creates 'double insulated Earth free' supply inside the cage, though this is often beyond the average amateur's means (and your local Sparky's experience) and needs serious safety considerations. Almost any radio gear can be run inside a Faraday cage on DC supplies; burglar alarm batteries are an option (but charged outside the cage).

## The cheap & cheerful way forward

- Find the source and eliminate it (a directional loop antenna can help here and look for noisy / sparking commutators in electric motors, SCR dimmer switches, etc.) and try snubber networks (low ohms resistors in series with µF's are commercially available for this job) across AC Line 1 to AC Line 2 of the offending supply or item. This can often entail 'delicate' conversations with neighbours who might have no idea they are blotting out acres of radio reception.
- Shield out air borne noise with screening cages (galvanised wire mesh with ½" or ¾"

holes is solder-able and can form effective screening, even if not a completely closed volume).

- Balanced Hertz antennas cancel common mode noise (loops, folded dipoles, in fact any Hertz antenna that needs no earth connection) and can help with QRM reduction.
- For Marconi antennas, try counterpoise grounds (not connected to a ground rod!) to eliminate Earth borne noise (try twin core flex (a.k.a. Zip Cord) shorted at the far end, and only connect one core to the receiver so clockwise turns always have an equal counter -clockwise partner).
- Establish a time and date record of the QRM. (It might tie in with a local factory start time, a neighbour's lawn mower, or another regular onset. Any pattern helps find the source.)

There is no guaranteed technique to eliminate QRM, but these industrial practices adapted to domestic environs usually reduce the bother. If all else fails, consider VHF / UHF: 6m and up can be noticeably QRM clear with only electronic shot noise to contend with - and effective bandpass audio filtering can work wonders shifting most of that.

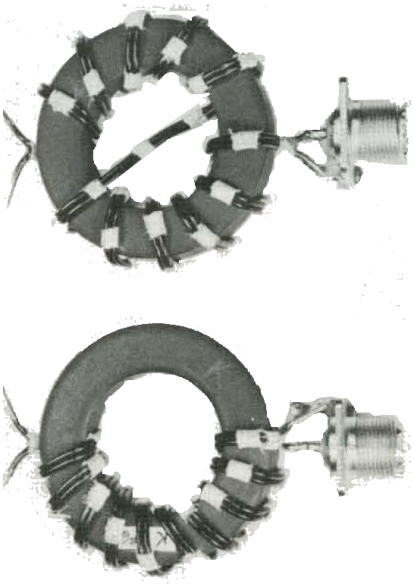
## Donder und Blitzen - Station Grounding

Grounding information can be integrated with Peter's information about QRM, presented above. Such information might be helpful, both in terms of QRM reduction, ground loops and safety – see below. Be sure to read W8JI's web page concerning station grounding, which explains different paths lightning can take to wreak havoc on your equipment. Suitable grounding is needed, especially in certain lightning-prone areas. W4NPN's first home in North Carolina was hit twice; the first time it exploded a 100+ year-old Poplar tree ten feet from the house, throwing bits of it over 300 feet away and the second time it slightly charred a few rafters. Both times resulted in some commercial equipment loss (but the tube ham gear survived). Yes, I moved to a different home, and yes, it really gets your attention when it happens at 2 AM.

Click here for the ARRL's notes on station grounding.

The Smoky Mountain Amateur Radio Club has a good web-based publication regarding station grounding.

~ *Courtesy HOT-Iron-121-pdf*



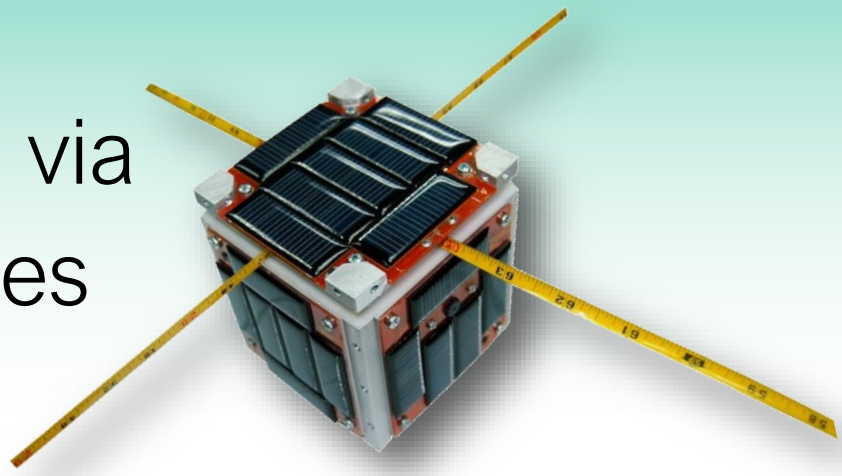
## *A Simple Current Balun:*

Jerry Sevick's (W2FMI, SK) designs for 1:1 current baluns are below (source: April '94 CQ magazine, illustration H). Mine are wound on a T200-2 core, using #14 (1.628 mm) insulated house wire. Since I used insulated wire on a bare core, I added one more turn. My windings use the full circumference of the 2" toroid and both my homebrew tuners like it on 80 – 10 meters.

There is a huge amount of Web info about baluns; some good and some not so good. Try this page to get started. I am no expert whatsoever on baluns, no matter how much I read, so I rely on experts like Sevick. And finally, much information about Ladder Line (a.k.a. twinlead) can be found here.

~ *HOT-Iron-121-pdf*

# Communication via the Tevel satellites



## One a time

By FRED STAM

Since the launch of the Tevel satellites by SpaceX, they have been immensely popular among ham radio operators. The satellites were developed in Israel by the Herzliya Science Center.

The satellites were manufactured at as many as eight different schools in Israel. The Nano satellites (cubesats) then boarded a Falcon rocket launched by SpaceX as a payload. SpaceX is that Mr. Musk company, Twitter now called X. The eight satellites, sized 1U = 10 x 10 x10 cm and weighing less than two kilos, all have a transponder on board. There is also a Dutch touch to the whole story, the basic satellite was supplied by ISIS space from the Netherlands. The students built and developed the satellite as a learning project. The satellites are in orbit at an altitude of 520 km.

### How they work

The eight satellites operate on the same frequency. If the footprint of all the satellites overlap, only 1 satellite works.

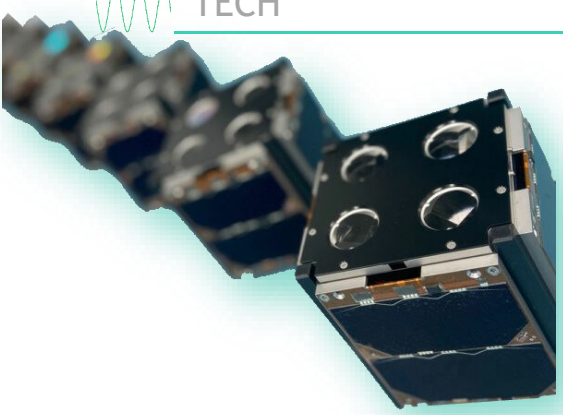
They operate on the following frequencies:

Beacon broadcast at 436.400MHz 9600 bps BPSK FM transponder uplink frequency: 145.970MHz FM transponder downlink frequency: 436.400MHz

There are various apps for Android and Apple that show how and where the satellites traverse and whether your QTH falls within their footprint. Heavens Above and AMSAT Droid Free are two apps that work well. But check whether the Kepler data needs to be updated.

Of course, you must also have an antenna, preferably one that is tuned for the frequency used. You can buy an expensive Arrow cross-Yagi dual band antenna, but for a lot of amateurs, that's quite an expense. There is also a European representative, but there you also pay the significant price. More fun is making your own. You need a pipe around 20mm thickness, made of impact-resistant PVC, a sock in front and some aluminum TIG welding electrodes 3.2 mm thick. There are plenty of construction drawings on the internet. There are sometimes some size differences, but that has to do with which frequency you use as a peak frequency. You can of course make a very fancy antenna with 3D printed supports for the director and reflector, but you have to have the time and skills for that.

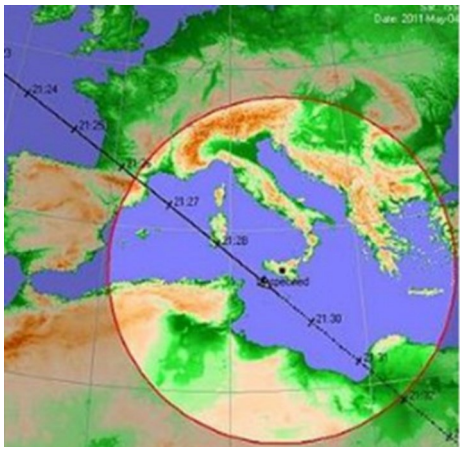
**Fred Stam PE3FS** is a Dutch Radio Amateur who has written for, and edits the publication of the Dutch Amateur Radio Union (DARU).



And then, for the first time, you're standing outside with your handheld or other transmitter, staring at your phone, and listening carefully to what's coming out of your transceiver. Suddenly you hear an Italian or someone from Spain repeating his call repeatedly. You answer with your call and locator, and you have made a connection. You casually mention that it's Five Nine and instruct your secretary to process this QSO in the logbook. Well, not really. You don't have time for that because the next one is already reporting. So, keep working, because it only takes 10 minutes before the satellite disappears behind the horizon again. In open field, connections at an angle of 10-20 degrees can be made. It's great when it comes right over your location, then you have strong signals and a little longer to make a few contacts. Of course, here in Europe, with an Italian or another European, we've all had a QSO there before. Terrestrially it's not that exciting, but it's different via satellite… and that's exciting, I can tell you.

The Doppler effect is also something to consider. The frequencies change as the satellite gets closer to you and moves away from you again, so it's good to pay attention. Read up on the operating practice and watch videos of how it is done. Again, there is plenty of information on the internet and YouTube is a good source of information. In fact, if you can't find it on Google, YouTube will give you an answer.

## Equipment



An antenna. But we've already talked about a handheld with a crossband antenna (transmit on a different band than receive) so, send at 2 meters and receive at 70cm. Possibly two handhelds, one listening at 70cm and the other for use as TX. Possibly an IC-705 but not everyone has that. It is another transmitter that can be used outdoors and that can work crossband. You must also be able to broadcast a tone because sometimes you must open the transponder with that tone. The tones differ in frequency per satellite.

## Which Satellites

I started with the eight TEVEL satellites but there are more. SO50 and of course the ISS. In the Apple, Windows or Google playstore you can find plenty of apps in which you can find needed data such as Keplers, turnover rate, frequencies, etc. Heavens Above is a very useful one. Advice: just search and compare features.

How we did it was as follows: At home you look to see which satellites have a 2/70 transponder. Based on this, you look for which frequencies you should use. And most importantly when they come across and at what angle. In the overcrowded west of the Netherlands, you can hardly find an open space where you can look to the horizon without seeing any buildings. We were happy when we "heard" them come across at 30 degrees and higher.

Sometimes we were in a location where things were better. Occasionally you could hear signals, reflected against a rain shower or, very briefly, when a plane flew over in the distance. And that happened a few times. It's fun to experience; and with Schiphol airport nearby, it's not that uncommon to experience this effect. At first you don't know what you're hearing, and soon it's over. But that was a bonus for us.

Advice: discover for yourself what is possible and what is possible with your own resources. Those satellites will continue to come over for the time being. You will notice for yourself, a QSO via satellite is a special QSO.

*~ Fred Stam*

*With thanks to DARU for permitting the translation and republication of their articles.*

*For beginners, try Clint K6LCS's Work-Sat website.*

# Team Canada at the 2023 ARDF World Championship

## Liberec, Czech Republic

by NICK ROETHE DF1FO

This year's ARDF Championships were the first 'regular' Champs since Korea 2018. Corona and Putin's war against Ukraine ruined several planned ARDF events.

The Russian government did not allow their team to attend, because they consider the Czech Republic (and all EU countries and many more) as an unfriendly country. Had they attended, many other countries (including Canada) would have not, or the Czechs would have cancelled the event. In other words: we are definitely not back to normal.

So this year the Czechs hosted the Champs. I knew, that they are great in organizing ARDF events, and Liberec is just 600 km from my home town in Canada's Fareast (= Stuttgart). So I wanted to go, and Joe Young supported me. With me was my wife Brigitte. She won 4 medals for Germany in Korea 2018, but this time she would just support me as Canadian trainer and team leader, and run in the training events.

The schedule of the event was:

- 8/25 Open training 2m and 80m Classic
- 8/26 Open training Foxoring and Sprint
- 8/27 Registration and Opening Ceremony
- 8/28 Classic 2m (80 m for the younger)
- 8/29 Sprint
- 8/30 Free Day and R1 Workgroup Meeting
- 8/31 Classic 80m (2m for the younger)
- 9/1 Foxoring

Before I go into details, here are some important links. The results and truth maps with all imaginable details:

https://ardf.darc.de/contest/23082801/23082801.htm

Wonderful short videos of all the events:

https://www.youtube.com/@radiovyorientacnibehcze660/videos

**Nick Roethe DF1FO** is a is an avid ARDF enthusiast and has designed and marketed his own line of ARDF receivers. Nick was the sole Canadian participant in the 2023 World ARDF championships held in the Czech Republic

And if you need a general overview what ARDF is about:

http://www.homingin.com/intlfox.html

## Weather

The weather was very hot (33 deg) and sunny on the first training day. From then on it got cooler with some or a lot of rain every day and temperatures between 15 and 20 degrees. The temperatures were good for running, but the rain was miserable at times.

## Lodging and food

The organizers offered lodging and food in a student dormitory in small double rooms, two of them sharing a bath. We like it more comfortable, so we stayed in the nice 'Grand Hotel Golden Lion' from 1906 in a large suite. That was convenient, because you have to wash and dry your running gear daily…

From the hotel it was five minutes by car to the event center in the dormitory, or to the parking lot, where the busses left every morning at 8.00 to take us to the (secret) start area of the day. And a five minute walk to the central marketplace.

Friends told us, that the food, service and the atmosphere at the cafeteria of the dormitory left room for improvement.

Well, you get what you pay for. There were many nice restaurants in town with good Czech food.

The prices for hotel, food and beer are about 40% of Vancouver Island, so you can live like kings for little money!

## The two training days

The first day of training was in walking distance to the event center. Classic 2m and 80m courses were on the air all day, and everyone was free to go out anytime. Maps were handed out at the start. Timekeeping was optional.

I started with the 2m course and immediately lost map contact. I believed to be in the middle of the map, when I actually was at the eastern edge… Bad beginners mistake, but I learned my lesson, and for the rest of the week I always knew precisely where I was. I did all 2m foxes and then two of the 80m. That was enough for an M70!

On the second day of training there was a Foxoring course out in the morning, and a Sprint in the afternoon.

For us the training was very useful: we could check the settings of our receivers (frequencies, distance estimation), and learned, what to look for (no flags on Sprint and Foxoring, just SI-stations on a black rod).

And we learned that the terrain is rough. A lot of open forest, but open often means a cover of blueberries, with hidden rocks and dead wood. And it goes up and down all the time, sometimes so steep, that I did not dare to go down and had to take a detour. In some areas there are many big boulders, that we had to zigzag around.

## Opening ceremony

The next day was registration day. In the morning we explored Liberec, a leisurely 10 km walk. Liberec was a center for the industrial production of woven fabric and a rich city around 1900. You still find the old factory buildings, mostly in ruins, and the grandiose villas of the factory owners, mostly nicely renovated.

In the afternoon it took us 5 Minutes to pick up our badges and other material. And much longer than that to say ‘Hello’ to all our old ARDF friends from around the world. In the evening there was a short opening ceremony in the technical university.

## 2m classic

Busses took us to the secret start point of the first classic race. Well, we had pulled a map of the area from the ‘World of Orienteering’ website, the finish site was in the Bulletin, and there was only one logical place left for the start. And there it was. So we had analyzed the map and the profiles and possible strategies in advance. Just like most other competitors.

From the training I knew what to expect: a challenging course. However this time the forest was soaking wet, and the reflections were much worse. Finding my first fox was a struggle, I spent about 15 minutes for the last 400

meters. But the next two foxes (I only had to find three) went smooth. I made a mistake on the way to the finish that cost me another five minutes.

Anyhow: I finished 8th of 27 starters and was happy. The Canadian trainer told me, she doesn't believe I can make it into the top 10 in the coming three 80m contests. Thank you for motivating me!

*Soaking the wet beacon*

### Sprint

The next day was the 80m Sprint. The bus had to drive 40 minutes,s to bring us to a suitable area without steep inclines. It was raining hard, but the organizers had put up enough tents in the waiting area for all 330 competitors.

Most of them, including myself, have little experience with Sprint, do it only once a year or less. Only the Czech and Ukrainian teams train this regularly. So it is basically a fun event. I did ok, maybe lost 2 minutes on the way to MO.

And made it into the Top Ten again!

### Rest day

The third day is traditionally an excursion day. But this time, due to budget constraints, it was just a free day. It was raining again, so we drove half an hour north to Friedland and took a nice tour of the huge castle and palace. The rain stopped at 13.00, and at 13.30 we teed off on the beautiful Ypsilon golf course on the way back to Liberec. We had hoped to ride a buggy, but the course was too wet and we had to walk. Another 10 km and 150 meters incline…

### 80m Classic

The 80m Classic was serious business again. 80m is basically easy and all competitors have trained it extensively. And I have two disadvantages: I do not run off-trail, because I do not want to hurt myself. And I always request an early start time, because I hate waiting (the last starters have to wait over 5 hours, for me it was just over an hour). Early start time means you get little help from watching where your competitors are running, and you can't follow the 'elephant trails'.

I lost 5 minutes on the way to my first fox, the others were good. On the way to the finish there was a biathlon shooting range in the way. We had been told, that no shooting would be going on that day, and that we may run through the range. Well, when I got there I heard shooting going on. I have respect even of calibre .22 lr, so I decided to fight my way around the range. Another 2 minutes lost.

When I came to the finish the sun was shining!

And I (just) finished in the Top Ten again. Take that, trainer!

### Foxoring

This discipline is dominated by runners with orienteering background. They are much better in running in rough terrain and in reading the map. And the terrain was really steep this time. The Czech and Ukrainians have specialists, who do only Foxoring (and lots of Orienteering). They achieve incredibly short run times.

On the other hand several excellent foxhunters, that took medals in the Classic races, got lost and had very long runtimes or had to give up. I kept close map contact, as in an orienteering race. I could hear the foxes from about 200 m distance, and had no problem finding them. I made no mistakes.

But given the terrain I had to go slow. I was wearing hiking boots and ran only in the finish corridor, for the entertainment of the spectators and photographers.

9th place, Top Ten again, by my standards an excellent result.

### Meeting old friends

The whole event is one big ARDF family meeting, and you have plenty of time before and after the races to talk to old and meet new friends. As Dilbert and Dogbert said: 'It's like salmon returning to its birth place.

*After every race competitors queued for a free beer. The Czech beer is excellent!*

But without the spawning opportunity.'

Competitors from many nations use my receiver design and want a photo with me or ask for additional features and software changes. Or hope, that I can heal their broken receiver just by looking at it…

And the Canadian trainer distributed 'ARDF Canada' chocolate bars and gummy bears – they were in high demand. In the middle of the photo *[bottom right]* is Lisa, 17 years, winner of a bronze medal. She built her receivers (my design) herself! She participated in dozens of the trainings my friends and I organized in the Stuttgart area. I am very proud of her results!

And the bare-chested sportsman is Mykola Ivanchikyn. He is a great guy and good friend, and has been the Ukrainian team-leader for many, many years. He speaks about 100 words of English, and I speak 10 words of Russian (yes, no, two beers, thanks, cheers…) But we can easily communicate when

*Try to imagine what it must feel like to stand on the podium in front of your old Ukrainian team, many of them on leave from army duty, wearing a foreign team-shirt and hearing a foreign national anthem, played in your honour. And not knowing what the future holds for you and your old team. Not easy.*

*Several more Ukrainians, and also Russians, ran for Germany and some other European teams.*

it comes to terrain characteristics, probable fox locations, strategies. He is also the reason, why the Ukrainian company RigExpert built my receivers commercially.

Today Mykola is one of the one million Ukrainian refugees living in Germany. He could not participate in the Ukrainian qualification events, but he qualified for the German team, and he won several medals for Germany.

## Looking forward

The Czech team staged a perfectly organized event. Everything worked flawlessly, the terrains and maps were excellent. All was fair, and as far as I know there were zero protests. We had a really good time, and, most important, I did not hurt myself. I sent the event director Miroslav Vlach and his team an Email with a huge 'Thank you' from ARDF Canada.

The next World Champs will be 2025 in Lithuania.

~ *Nick Roethe DF1FO*

*nick@df1fo.de*
*www.df1fo.de*

# RAC News

## ARDF Co-ordinator Call for Volunteers

Joe Young VE7BFK has been ARDF (Radio Orienteering) co-ordinator for RAC for many years and would like to step[ down to assisting a new co-ordinator.

Amateur radio direction finding (ARDF)—also called Radio Orienteering, foxhunting, or transmitter hunting— can take many forms. The game described here has been standardized and fostered by the International Amateur Radio Union since about 1978. The object is to locate and visit on foot each of up to five transmitters concealed in a wooded area in as short a time as possible by using a directional receiver to obtain bearings to the transmitters. The transmitters (foxes) all transmit on the same frequency, but take turns transmitting a unique signal for one minute and are silent for 4 minutes while the others transmit. The skills needed to succeed include obtaining accurate bearings with the receiving gear, navigating through the wooded area using map and compass, and devising a strategy to visit the required sites in the minimum time. See Fig (whyjustrun.ca) for more information.

The duties of the ARDF co-ordinator include:

- Locating sites in Canada interested in ARDF to make a list of contact persons for each site.
- Maintain a central location for fielding inquiries about ARDF.
- Interact with the IARU North American coordinator, US coordinator regarding sites for North American games. Publicize these events.
- Organize a Canadian team for IARU events.

If you are interested in this position, please make contact via the email below.

~ *Keith Witney VE7KW*
*ve7kwbc@gmail.com*

**Keith Witney VE7KW** is the Director – British Columbia and Yukon Region for Radio Amateurs of Canada. Keith was one of two "Amateurs of the Year" in 2017 for his efforts in organizing VE100VIMY, a special event station located at, and commemorating the 100th anniversary of the WW1Battle of Vimy Ridge.

# Around the GOTA Corner

## The boy who cried break

### A fable

by LARRY BLOOM VE7LXB

**Larry Bloom, VE7LXB** is a retired high school teacher who passed his Amateur Radio Basic with Honours in late spring 2022. Larry is the SARC New Ham Coordinator as well as a Director with SARC and is passionate about helping new hams get started in Amateur Radio.

There once lived a shepherd boy named Mythos. Like most in his village, Mythos had his ham license. After all, the village was remote and the villagers needed something to occupy their time.

Mythos especially loved the 2m nets. Bored and lonely, he would amuse himself by rambling on during the Roundtable Discussions. Aware that the repeaters might drop him due to his long-windedness, Mythos would announce BREAK, take a breath, then continue his thoughts.

One day the boy's father suggested Mythos use RESET instead of BREAK. He reminded the boy that by convention, BREAK was reserved for emergencies - like the danger of a nearby wolf.

"But many hams use BREAK, "the boy responded. "Why should I be different?"

"Would you jump off a cliff if others did?" his father asked.

"Not the same thing," the shepherd boy replied, and laughed.

To the boy's astonishment, the next night a villager rushed up the hill and asked if he had seen a wolf. "Of course, not," the lad replied. "I'm resetting the repeater!" "Then why not say RESET," the villager replied.

Mythos just chuckled and went back to his sheep.

Over the next month, this scenario repeated twice again. To his naughty delight, Mythos enjoyed watching the villagers rush to his 'rescue' hoping to drive a wolf away.

Finally, the frustrated villagers told the boy, "Save your BREAK for when there is danger! Don't use BREAK when there is NO wolf!"

The young man just grinned and watched them leave, grumbling as they went back down the hill.

One day, Mythos saw a REAL wolf prowling about his flock. Alarmed, he leapt to his feet and loudly yelled into his mic, BREAK! BREAK!

But the villagers had heard it many times before and so they didn't come.

At sunset, the villagers wondered why the shepherd boy hadn't returned to the village. They climbed the hill and found the boy weeping, his sheep nowhere to be found.

"There really was a wolf here! The flock has scattered! I cried out, BREAK. Why didn't you come?"

“We’ve heard it all before,” a villager replied.

The boy’s father tried to comfort him as they walked back to the village. "We'll help you look for your sheep in the morning," he said, putting his arm around the youth, "Perhaps it’s time you took a break from ham radio."

*~ Larry VE7LXB*

# The unseasoned ham

Watching our GOTAs (new hams) continue their journey is both fascinating and gratifying. The big step after they’ve ‘mastered’ their HTs is making the leap to VHF/UHF mobiles. They learn quickly that there is a world of difference between 5w and 25w. Many of our newbies struggle mightily to participate in our weekly GOTA Net. Some find they can only listen; others seem ready to throw in the towel after numerous futile attempts. The key to helping them get over the hump is helping them choose their next purchase wisely. A perfect example is my friend Dale VE7LWT who tried for months with limited success to access our GOTA Net. His Baofeng and Jianpai simply couldn’t cut the mustard even with the j-pole he made in our antenna class. Now he’s full quieting using an old 25w Tait 2000 paired with the same j-pole. It’s completely changed his perspective on Amateur Radio and I’m betting his next purchase is an HF rig.

Speaking of the GOTA Net, it’s not only our GOTAs that have helped make the Net a big success. It’s also the Elmers that drop by offering to assist our newbies with their ham-related questions. So, here’s a shout-out to those Elmers: Daniel VE7LCG (who is a regular contributor to The Communicator); Rob VE7CZV; Reg VE7ZEB; Gary VE7GPR; Fred VE7MPI; and especially John VE7TI who is our resident GOTA Net Elmer and editor of this amazing newsletter. Thank you all.

That’s it for now.

73

*~ Larry VE7LXB*

Tried to get the tower installed before the wife got home

Where is The Communicator read?
North Atlantic Ocean
South Atlantic Ocean
Indian Ocean
Now read in 145+ countries and
our last issues had over 22K downloads!

# Ham Radio

## Outside the box

# A DIY antenna launcher – for pennies

### There are countless methods of launching a wire antenna

by JOHN CORBY VA3KOT

**John Corby VA3KOT** resides in Owen Sound, Ontario but is more often found operating CW out in the "Big Blue Sky Shack". He especially enjoys activating parks for the POTA program and blogging about his experiences at HamRadioOutsidetheBox.wordpress.com

There are countless methods of launching a wire antenna into a tree that have been written about online. For example a PVC pipe air pressure machine. Sounds downright dangerous to me. Maybe they work just fine, but what if one of the joints isn't glued properly and the darned thing explodes in your face? Besides, its a rather large piece of kit to haul up a mountain or out into the bush.

An old faithful is the slingshot used to fire a fishing weight on the end of a long length of nylon line. There are several drawbacks to this method, not the least of which is the use of slingshots being illegal in some jurisdictions. A slingshot can get a line very high into a tree, but just how high do you really need to go? For field expedient, temporary antennas, around 30 feet works well in many circumstances.

A simpler method involves throwing a weight attached to a line up over a branch. Some have suggested using a water bottle as the weight. Others prefer to invest in an arborist throw line with a leather pouch filled with half a pound or more of steel pellets acting as the weight. If it works for the professionals it's gotta be good right?

My own method is constrained by my unique inability to throw anything in a straight line. I have written before about my baseball

pitching skill of picking off runners on first base – while aiming for the plate! So I devised my own highly efficient method of launching antennas into trees that works and it's cheap, really cheap.

The arborist method is great if you have a good arm and fine hand/eye coordination. If you don't mind investing in professional tools only to see your investment irretrievably stuck in the brush at the top of a tree then go for it. An alternative is to make an antenna launching kit yourself with materials you probably already have, or can get for free, or in a pinch, can buy at a dollar store.

Here is what you will need:

- Latex party balloons (dollar store). Brightly colored balloons are easier to spot when your line gets stuck in a tree, or falls into long grass
- A small quantity of dry, fine sand
- Some small steel key rings
- About 100 feet of mason's twine (dollar/ hardware store). It is strong, yet very lightweight and slides through a tree quite well. I prefer a "woody" color like green because I use it to haul up my temporary field antennas. Woody colors keep the installation stealthy
- A couple of short lengths (about 12-18 inches) of paracord
- A small piece of rugged cloth, e.g. canvas or leather, about 9 inches long and 6 inches wide
- A trekking pole from which the tip has been removed leaving a smooth, tapered surface

## Making "Sand Grenades"

"Sand grenades" as I call them, form the weights needed for the DIY arborist throw line. To build each one of these you will need 2 balloons, 4 ounces of sand and 1 key ring. I suggest making several sand grenades because Murphy says you will lose them. I have lost several by getting them stuck in a tree or overthrowing them into a swamp.

Step One: stretch the balloons, then roll one of them along its length and, with a bit of jiggery-pokery, insert it inside the other balloon

- Step Two: Insert the tip of the funnel into the balloons and fill with sand. A kitchen scale is useful to measure the weight required
- Step Three: Tie the neck of the balloons around the keyring

## Making a "David and Goliath" Sling

This style of sling comprises a canvas/ leather/cloth pouch that is pinched together at the ends with a short length of paracord tied to each end. The size of the pouch

*2 latex party balloons, a keyring and a funnel for filling with sand; The finished "Sand Grenade" I like to mark the weight with a sharpie marker.*

should be sufficient to allow a sand grenade to nestle inside without falling out.

## How to Use the DIY Antenna Launcher

Tie one of the pouch's paracords to the end of a trekking pole, about 4 inches from the tip, using a robust knot such as a constrictor knot. You do not want this end to leave the trekking pole or else your sling will follow the rest of your kit up into the tree!

Tie the paracord at the other end of the sling's pouch using a slip knot. This end should lightly grip the pole near its tip. It will fly off and release the sand grenade as the launch is executed.

Why use a pole? In the bible story David did not use a pole to operate the sling with which he killed Goliath. But there was an ancient weapon used by the Romans and others (a "pole sling") in which a sling was attached to the end of a long pole. The pole provides mechanical advantage to increase the range and velocity of the projectile.

Now attach one end of the mason's twine by tying a bowline knot with the loop about 4 inches long, then pass the loop through the keyring and back over the balloon. Secure the far end of the twine (e.g. with a tent stake) and place the sand grenade in the sling pouch.

Place the trekking pole over your right shoulder with the payload behind you, then flip the pole sharply upwards into a vertical position. The sling will release the sand grenade which will travel 30 or 40 feet (hey, maybe more – how's your arm?) up into the tree.

*Top: Compactly folded sling and twine bundle*

*Center: Completed sling*

*Below: NB: The tip of the trekking pole has been removed to leave a smooth surface for the sling cord to slide off*

## An Even Simpler Alternative

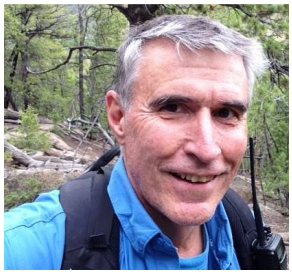
A simpler alternative to using a pole sling is a dog ball launcher. Simply substitute the dog ball with a sand grenade and fire away. I have used this method too but since I often carry trekking poles on my back country field operations anyway, I prefer the pole sling method.

*~ John VA7KOT*

# Why Use FT8 For POTA?

What are the main reasons that FT8 is useful for POTA?

by BOB WITTE K0NR



**Bob Witte K0NR** maintains a great blog site at https://www.k0nr.com/wordpress/

The FT8 station consists of an iPad, Icom IC-705, MFJ-902 tuner, a battery pack, and one of many wire antennas.

In a previous post, I described getting the IC-705 set up for FT8 using the SDR-Control app on an iPad. My objective was to have a portable FT8 station for use during SOTA and POTA activations.

To save time, let me get this out of the way:

Yes, I do know that making contacts via FT8 is not as personal and may not be as much fun as running a pileup on SSB or CW. Still, it is Real Ham Radio and enjoyable in a different way.

I've used this station on multiple activations now but I have to admit that these have been mostly for POTA. It seems that whenever I get on top of a SOTA summit, I tend to focus on making VHF contacts which consumes the available time and the HF gear remains stashed way in my pack. This is more about my operating habits than anything else. Looking at spots though, there is a lot of FT8 on POTA and not nearly as much on SOTA. The SOTA crowd tends to have a lot of traditional CW enthusiasts and maybe POTA has fewer of them. Also, SOTA operating is usually backpack portable so carrying a compute device for FT8 may be considered an unnecessary hassle. POTA stations are often in or near a vehicle, so station size/weight is less of a concern.

For POTA, I make sure my activation is posted at pota.app, indicating the park number I am activating. When calling CQ, I modify the standard FT8 text to be "CQ POTA" to indicate that I am doing an activation. When my signal is detected by the Reverse Beacon Network (RBN), a spot is created that shows me doing a POTA activation from that park. Pretty cool. If I have an internet connection, I monitor my spots

using the Ham Alert app. This provides useful feedback about where my signal is showing up around the world.

But what are the main reasons that FT8 is useful for POTA?

## FT8 is popular

In case you haven't noticed, FT8 has emerged from being just a niche activity to now being very popular on most ham bands. At times this can be a problem with the standard FT8 frequency slice being overloaded with signals. There is a lot of FT8 activity on the bands, for general ham use and SOTA/POTA.

## FT8 works well with low power

FT8 and the other WSJT-X modes are designed to work well with weak signals, so they are a great match for low-power operation. Of course, QRP power levels are very common for backpack portable activations, mostly due to the limitations of carrying a reasonable-size battery.

## FT8 signals are spotted on RBN

As mentioned earlier, FT8 signals are picked up and spotted by RBN. For better or worse, people have come to rely on spotting for many types of ham radio operating. When on a SOTA or POTA activation, you really want to be spotted as such. For phone activations, I usually do that with a smartphone but that requires some extra effort and a mobile phone connection. FT8 and RBN take care of that for you.

## FT8 logging is automated

The various FT8 software applications automatically log the QSO information, which means it is easy and less error-prone. After the activation, I just pull up the ADIF log file, check it for obvious errors, add in the SOTA/POTA info, and submit it to the appropriate websites.

## FT8 is campsite friendly

This last one may be a bit subtle but I've found FT8 to be campsite friendly. By that, I mean I can get on the air at any time (early, late or at nap time) and not disturb anyone else. (On SSB, I would likely be enthusiastically yelling into the microphone trying to work a pileup.) Besides the audio noise factor, FT8 operation allows for multitasking. I can converse with my fellow campers while still keeping up with the FT8 flow. Alternatively, I can cook dinner, make a fire, or pack my backpack while the FT8 QSOs roll in. This may sound a little bit like cheating but, hey, whatever works.

## Wrap Up

So clearly, I've been having fun with FT8 for POTA. I consider it to be another tool in the toolkit. There are times when I will make good use of it but there will also be times to use other modes.

*~ 73 Bob KØNR*

*Check out Rob's book VHF, Summits and More: Having Fun With Ham Radio.*

*This book is an easy-to-understand introduction to VHF/UHF ham radio, including practical tips for getting on the air and having fun messing around with radios. Learn about FM, SSB, repeaters, equipment, band plans, phonetics, portable operating, Summits On The Air (SOTA) activations and more.*

# Vintage Radio Reading

## I really love old radio magazines

by STEVE McDONALD VE7SL

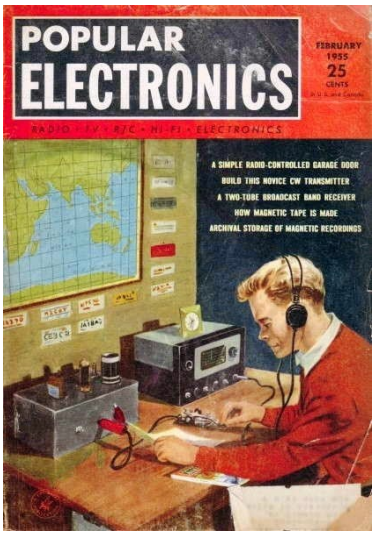
**Steve McDonald VE7SL** Reproduced with the author's permission, Visit The VE7SL Radio Notebook at: The VE7SL Radio Notebook and Steve's blog at VE7SL - Steve - Amateur Radio Blog

I really love old radio magazines, especially those from the 30's, but to purchase any original copies today is very costly. If you grew up in the 50's or earlier and became hooked by the magic of radio as I and thousands of other kids did, then you no doubt recall the plethora of great monthly magazines devoted to 'radio'.

Now, thanks to AmericanRadioHistory.com, most of those great old hobby magazines of the past can be viewed online and enjoyed once again.

Just a few of the many magazines available are: Radio Craft, Short Wave Radio, Radio, Radio World, White's Radio Log, Popular Radio, Popular Electronics and Radio Amateur News, later to become Radio News.

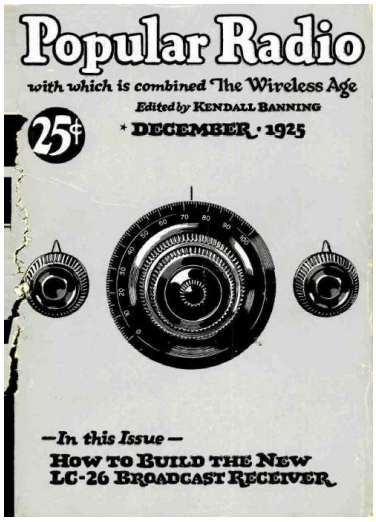
*Click on these coves for web links*




As a pre-teen short-wave listener in the late 50's, I couldn't wait to get my hands on the latest edition of Popular Electronics, stuffed with its latest SW broadcast news, frequency lists and DX stories.

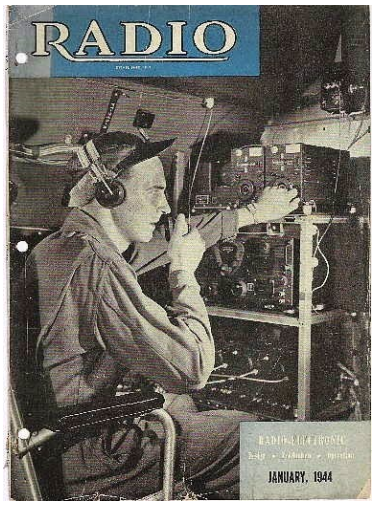
I'm not sure if all of this is the organizational work of just one person (Webmaster David Gleason) or of a larger group, but it is an incredibly rich resource that has been made freely available for everyone to enjoy.

Thanks to David Gleason's work, I always have several of my favorite classics downloaded to my I-Pad's bookshelf for offline reading. With hundreds of recent updates this spring, there appears to be a lifetime of vintage reading now available!



As a builder of vintage-style radios, particularly transmitters, I can often find new inspiration from the magazines particularly devoted to ham radio. If your workshop library is lacking in vintage reference material, you need look no further than this site for a vast source of building inspiration....transmitters of all description along with receivers from crystal tuners to complex multi-tube designs.

So many of these early publications were the brainchild of Hugo Gernsback, a prolific writer and editor of both technical and science fiction magazines but sometimes blurring the boundaries of each! I suspect that his wide variety of radio publications had some significant role in the way radio so quickly transformed the world.



Even in the 50's, long after the 'golden years' of radio, it was not uncommon to still see radio antennas on most houses, at least in my neighbourhood!

If you haven't visited this wonderful resource yet, I'm sure you will be amazed at what you find.

*~ Steve VE7SL*

*Please remember also the fabulous historical archives available at the Digital Library of Amateur Radio and Communications [https://archive.org/details/dlarc](https://archive.org/details/dlarc) which includes all past issues of [The Communicator](The Communicator)*

VE9KK

# Modes for ham radio

## And the condo life

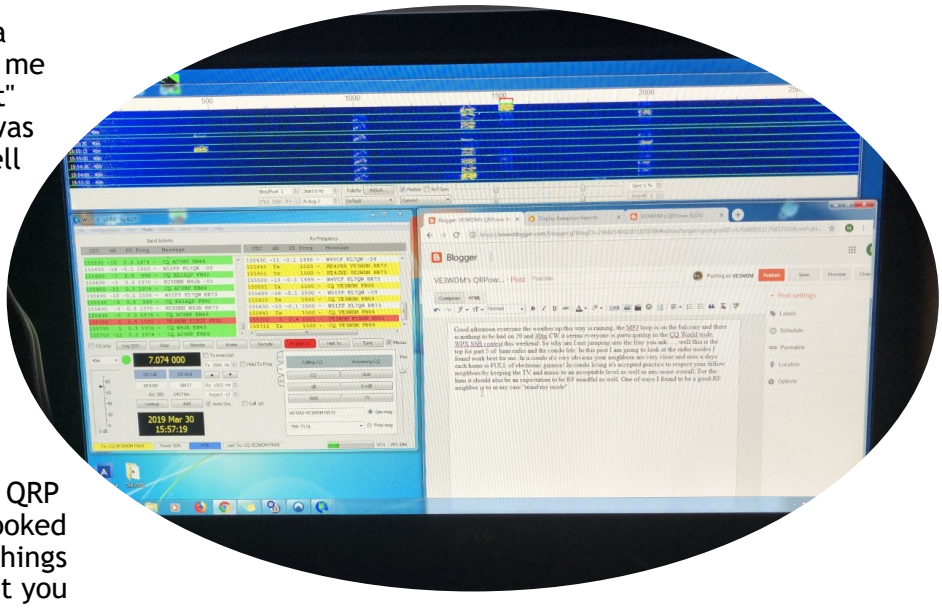
by MIKE WEIR VE9KK

**Mike Weir VE9KK** was first licensed in 1989 and upgraded to advanced in 2000. He primarily operates contests both CW and RTTY.

Good afternoon everyone the weather up this way is raining, the MFJ loop is on the balcony and there is nothing to be had on 20 and 40m CW it seems everyone is participating in the CQ World wide WPX SSB contest. So why am I not jumping into the fray you ask… well this is the topic for ham radio and the condo life. In this post I am going to look at the radio modes I found work best for me. In a condo it's very obvious your neighbors are very close and now a days each home is FULL of electronic gizmos! In condo living it's accepted practice to respect your fellow neighbors by keeping the TV and music to an acceptable level as well as any noise overall. For the ham it should also be an expectation to be RF mindful as well. One of the ways I found to be a good RF neighbor is to in my case to make sure I "mind my mode".

Years ago when I was in a townhouse and decided to spend more time with my radio hobby. It just so happens the upcoming weekend was the Canada day SSB contest. I had a nice Yaesu FT 1000 MP radio and I was all set to dive right in. My antenna was out on my car a far distance way with coax running out to it. The first day of

the contest ended and I was having a blast until my fellow neighbor asked me "did you hear "CQ contest CQ contest" from my speakers! I said no (which was the true I didn't) but knowing full well what was going on the Canada day contest came to an end and the thinking cap went on.




I could go and see them to explain it could be the poor electronics they have that is picking up my signal… not a good idea I thought as this can just open a HUGE can of worms! The plan I came up with to keep me on the air was to become a QRP (low power) operator. I very much looked forward to this and as I looked into things I also came to the understanding that you get more bang for your watt with CW than you do with SSB. My first but not only mode for ham radio in a condo is CW. Now there may be readers who are thinking "nice idea but I am morseless" funny thing so was I. Some time ago did have a basic understand but far from proficient. I set out to learn CW and it did take time and remember I did say earlier I really liked contesting so the goal was to get my CW up to contest speed in around 25-35 WPM.

Years ago I was introduced to the digital modes but found it very frustrating to get the PC to play nice with the radio and digital program. It would seem all was working fine until I turned the the rig and the PC on and for some reason something else was wrong. I found it took more time to hunt the issue down than I was operating digital. So for some time I just stuck with CW and put the digital modes off to the side.

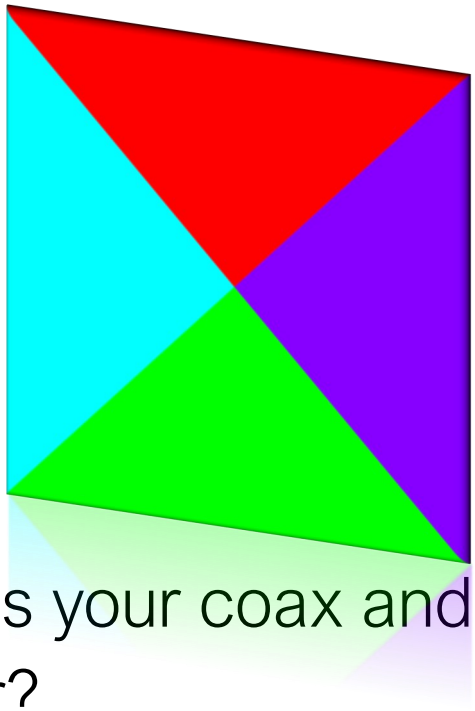
The next radio for me was the Elecraft K3 and the Elecraft reflector was booming with posts about getting your K3 up and running on the digital modes. Back then the popular modes were PSK31 and WSPR. I did still have some issues with the PC and rig talking to each other and did get frustrated at times.

At present my condo modes are CW and FT8 and at the present time FT8 is very popular. While writing this post I had FT8 running in the background and was able to make 12 contacts. Having said that I do find CW more interactive but today with the SSB contest going on CW contacts were far and few to be had. The rig I have now is the Icom 7610 and it is a breeze to get working with digital.

Do give me your feedback with modes you are using in your condo. The next topic for ham radio and the condo life is dealing with close neighbors and most likely being in a city or built up urban areas is electronics causing you grief with there noise.

*~ Mike VE7KK*

# Foundations of Amateur Radio



## How much does your coax and antenna matter?

by ONNO BENSCHOP VK6FLAB

**Onno Benschop**
**VK6FLAB**
To listen to the podcast, visit the website: http://podcasts.vk6flab.com/. You can also use your podcast tool of choice and search for my callsign, VK6FLAB.

Full instructions on how to listen are here: https://podcasts.vk6flab.com/about/help

Recently I explained some of the reasons why I've shifted to using dBm to discuss power. You might recall that 1 Watt is defined as 1,000 mW and that's represented by 30 dBm. 10 Watts is 40 dBm, 400 Watts, the maximum power output in Australia is 56 dBm and 1,500 Watts, the maximum in the USA, is just under 62 dBm. My favourite power level, 5 Watts, is 37 dBm.

I mentioned that using dBm allows us to create a continuous scale between the transmitted power and the received signal. On HF, an S9 report is defined as -73 dBm. Between each S-point lies 6 dB, so an S8 signal is -79 dBm, S7 is -85 dBm and so-on to S0, which is -127 dBm. Said differently, to increase the received signal by one S-point you need to quadruple the power output.

Now, let's consider a contact with a 100 Watt station, 50 dBm. Let's imagine that the receiver reports an S8 signal. That means that between a transmitter output of 50 dBm and the received signal at -79 dBm, there's a loss of 129 dB. If we dial the power down to 5 Watts, our 37 dBm will be received at -92 dBm, and earn a S6 report, which, in my experience, is pretty common. If we instead use the maximum power permitted in Australia, we'd gain 6 dB and end up at -73 dBm, or S9. The maximum power output permitted in the United States, 62 dBm, is only 6 dB higher and not even enough to get you "10 over 9" at the other end.

At this point I could say, see, "QRP, when you care to send the very least", and be done with it.

While it's true in my not so humble opinion, that's not where I'm going with this.

That 129 dB of loss is made up of a bunch of things. For example, there's the coax loss at either end, the antenna gain at either end and a big one, the path loss between the two antennas.

Let's assume for a moment that coax loss and antenna gain cancel each other out. You might think that's nuts, but consider that 100 m of RG58 coax on the 10m band has a loss of around 8 dB and a dipole has an isotropic gain of 2.15 dBi. In case you're not sure what that means, a dipole has a gain of 2.15 dB over the ideal radiator, a theoretical isotropic antenna. Now it's unlikely that you are going to connect a dipole to 100 m of RG58, so let's say a quarter, or 25 m instead. The coax loss is also quartered, or about 2 dB, which pretty much means that your dipole gain and your coax loss essentially cancel each other out.

So, as a working number, assuming both stations are similar and ignoring SWR mismatch, pre-amplifiers, filters, and all manner of other tweaks in the signal path, 129 dB loss is a good starting point to work with. If you use a free space path loss calculator, that's the equivalent of the loss for a 2,500 km contact on HF on the 10 m band.

Now, if you were to replace the RG58 with something like RG213 coax, the loss drops from around 2 dB to 0.9 dB, so your signal just increased in strength by 1.1 dB, or not enough to make any difference in this example.

Of course there's a benefit in using lower loss coax, I mean, 1.1 dB gain isn't nothing, but it really only matters when the conditions are marginal. If you're going to run your coax to the other side of a paddock, you might discover that your signal changes by a whole S-point, but realistically, most of the time you're not going to notice.

Similarly, and perhaps more importantly, in the scheme of things, your antenna is also just fiddling around the edges when compared to the path loss of 129 dB. For example, if you double your antenna gain, you're only seeing an improvement of half an S-point and most likely you won't actually notice.

Before you grab the nearest chicken to pluck feathers to come after me with, I'd like to point out that each element on their own has a minimal impact on the total system, but that doesn't mean that improving your station is useless, far from it. If you use quality coax, have an antenna that is performing well, is a good match to your transmitter and coax, use appropriate filters and pre-amplification, you're likely to make more contacts more often, but the bottom line is that you actually need to be on air to make noise and ultimately that's going to represent the biggest improvement in your station performance.

*All podcast transcripts are collated and edited in an annual volume which you can find by searching for my callsign on your local Amazon store, or visit my author page: http://amazon.com/author/owh. Volume 7 is out now.*

*Feel free to get in touch directly via email: cq@vk6flab.com, follow on twitter: @vk6flab or check the website for more: http://vk6flab.com/*

*If you'd like to join a weekly net for new and returning amateurs, check out the details at http://ftroop.vk6flab.com/, the net runs every week on Saturday, from 00:00 to 01:00 UTC on Echolink, IRLP, AllStar Link, IRN and 2m/70cm FM via various repeaters.*

*If you'd like to participate in discussion about the podcast or about amateur radio, you can visit the Facebook group: https://www.facebook.com/groups/foundations.itmaze*

*This podcast episode was produced by Onno (VK6FLAB). You can find more at http://vk6flab.com/*

Case in point, the other day my WSPR or Weak Signal Reporter beacon, with 10 dBm output, was reported 7,808 km away by DP0GVN, the club station of the German Antarctic Research Station "Neumayer III" in Dronning Maud Land, Antarctica, a first for me. WSPR reported that as a signal of -26 dB.

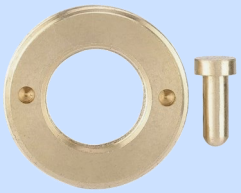
Previously I proved that when WSPR reports -31 dB, about 75% of decodes are successful. In other words, we can think of my report as being 5 dB above the minimum decode level. This is interesting for several reasons, least of which is that a report of -26 dB doesn't appear to have a relationship to anything else, something which I've observed before.

Looking further, if we use our notional 129 dB loss figure and start at the beacon power of 10 dBm, we end up at -119 dBm, which is between S1 and S2. In reality, the path loss for that contact is more likely to be in the order of 10 dB worse, making the signal at the receiver -129 dBm or around S0. In those kinds of marginal conditions, where there's 5 dB between being heard and not, finding an extra dB or two in better coax or antenna is absolutely worth the investment, but if you're in a contest making points, you're not going to care. Being on the right band, pointing in the right direction and being on-air making contacts is going to be much more important.

That said, I'll leave you with a question. Given our obsession with antennas, what might the impact be of adding an 18 dBi Yagi to your station?

*~ I'm Onno VK6FLAB*

## Need an inexpensive NMO antenna connector?



*NMO kit*

An NMO connector can cost upwards of C$60. I recently found a more versatile alternative on Amazon for less than C$10. Most of us have common S0-239 feed-thru adapters and the Amazon kit has a brass pin that's fits into the centre pole of the adapter and a threaded NMO-size brass ring that threads onto it.
The advantage is that the adapter can be any length and needs a smaller mounting hole or bracket than an NMO adapter and you can thread a piece of coax with a PL-259 of whatever length on the other end.

*Standard NMO*

# KB6NU'S HAM RADIO

## Proposal to use HF for stock trading

### RadioWorld update

by DAN ROMANCHIK KB6NU

**Dan Romanchik KB6NU** blogs about amateur radio at KB6NU.com when he's not trying to figure out which way current flows. Dan teaches ham radio classes, and operates CW on the HF bands. Look for him on 30m, 40m, and 80m. You can email him at cwgeek@kb6nu.com

Over the summer, the amateur radio world was all up in arms about a proposal by an outfit called the Shortwave Modernization Coalition—which doesn't have a website that I could find—that the FCC allow them to transmit high-power, wide-bandwidth digital signals between 2 MHz and 25 MHz. Comments were due by August 15, and RadioWorld has just published an update on the status of this proposal and the comments it garnered.

The article, "Hams Worry About Shortwave Proposal," is a pretty good summary of where we are just now. Here are a couple of key quotes:

"AARL (sic) adds: 'SMC also proposes to substantially lessen the protections required to protect adjacent and neighboring licensees… using digital schemes with 50 kHz bandwidths and 20,000 watts of power.'" If they want to transmit wide-band signals at such high power, they should be required to meet an even higher standard than normal for harmonic and spurious emissions. Instead, they're proposing that the FCC loosen the specifications.

"Another commenter from the amateur community said the FCC's ability to track and solve any possible interference issues is severely lacking." If the FCC could be counted upon to act swiftly should these transmissions cause interference, then the interference might not be a big deal, but as the commenter notes, the FCC just doesn't have the resources to do this.

Radio amateurs aren't the only ones who have commented on the proposal. Perhaps our biggest ally in this matter is the NTIA, which is the government agency responsible for

the development of communications policies that affect government operations. In their comments, they write, “To the extent the Commission considers initiating a responsive rulemaking, NTIA respectfully requests that the Commission recognize that much more information would be needed to ensure protection of the significant number of incumbent federal operations in the 2-25 MHz band.”

The comments then go on to detail all of the government operations that would be affected. They include the Maritime Mobile Service, the Aeronautical Mobile Service, and Federal Emergency Management Agency National Radio System (FNARS).

There are also comments from an SMC competitor. Alex Pilosov, founder and president of Shortwave Solutions says the coalition’s request “is premature, incomplete and poorly thought out, and against the public interest,” and that its “lack of substance is matched by its audacity.”

So, stay tuned. The SMC proposal faces a lot more opposition than just ham radio.

*~ Dan KB6NU*

# Ham Radio Wiki Seeking Knowledgeable Writers

*This popped up on /r/amateurradio yesterday, and I thought it deserved a bit more publicity… Dan*

I’m one of the founders of a project called OpenHam Wiki - a project dedicated to collecting ham radio knowledge in one central location for easy access and research for projects, on-air techniques and knowledge, and more.

Projects like this have been attempted before, but not many have attempted it with the right group and right tools. OpenHam would really appreciate more elmers registering and being willing to help create and edit content!

To join as a writer, register on the website and DM me your username either here on Reddit or to one of the admins on the Discord server (https://discord.gg/dtk9uuJGdQ). This is our current spam-prevention method, although we are working on a better solution. Once you’ve requested editor access, please give us 48 hours to get you setup.

We’re also looking for people knowledgeable in MediaWiki administration and writing to help us work on system administration, spam prevention measures, and style guidelines.

Overall, any help and writing would be greatly appreciated and we’d love some advice or notes on the project as a whole! I know it’s a costly endeavor and hasn’t been successful before, but I’m enjoying what we’ve worked on so far as my side project. :)

*~ Dan KB6NU*

# No-Ham Recipes

by MURIEL FOISY VE7LQH

## Microwave sweet and sour pork

What would some of us do without the convenience of our microwave ovens? They do certain things very well and really save time. Did you know that if you have a rock-hard tub of ice-cream, you can zap it a few times on medium to medium high for about 5 to 8 seconds per zap? This will soften it just enough to allow you to scoop it out. Use care - don't run the oven for too long or the plastic coating on the paper or the plastic tub will get very hot and release toxic fumes into both your ice cream and the air you breathe. And then your ice cream will be unbearably runny. You're poisoned and your ice cream isn't worth eating… Yikes! What a bad day, especially if you were trying to get your sweets fix for the day!

Muriel finds that this recipe doubles and freezes well.

- 2 tablespoons (30 ml) corn starch
- 3 tablespoons (45 ml) soy sauce
- ¼ cup (65 ml) packed brown sugar
- 1½ pounds (675 grams) cubed pork (fat removed)
- 13 ounce (390 ml) can pineapple chunks plus juice
- 1 medium green pepper, sliced thinly (optional)
- ¼ teaspoon (1.25 ml) ginger
- ¼ cup (65 ml) vinegar
- ¼ cup (65 ml) ketchup
- cup (90 ml) water
- 1 small onion, sliced thinly

In a 2 quart (2 litres) casserole, toss pork with cornstarch. Mix in remaining ingredients except green pepper. Cook, covered for 6 minutes on high setting. Stir mixture and then cook at defrost setting for 8 minutes, or until meat is done, stirring occasionally. Stir in green pepper and cook 1 minute. Let stand for 10 minutes. Makes 4 to 6 servings.

~

# Back to Basics

## From The Canadian Basic Question Bank

# Comparing Transistors, Field Effect Transistors, and Triode Vacuum Tubes

**John Schouten VE7TI** has been teaching amateur radio courses for over 20 years, and is the Course Coordinator for Surrey Amateur Radio Communications

In the world of electronics, the choice of components for amplification and switching is crucial. Transistors, Field Effect Transistors (FETs), and triode vacuum tubes have all played significant roles in the history of electronic circuits, each with its own set of advantages and limitations. The Canadian Basic Amateur Radio Question Bank has several question related to these components, so let's look at them more closely to provide a comparative analysis of these three technologies, highlighting their key characteristics, working principles, and applications.

Here are a couple of the sample questions:

**B**-4-5-1 What is one reason a triode vacuum tube might be used instead of a transistor in a circuit?

A It may be able to handle higher power

B It uses less current

C It is much smaller

D It uses lower voltages

**B**-4-4-6 Which semiconductor device has characteristics most similar to a triode vacuum tube?

A Zener diode

B Bipolar transistor

C Field effect transistor

D Junction diode

### Bipolar Junction Transistors

Transistors are solid-state semiconductor devices that have become the backbone of modern electronics. They come in various types, with the most common being the bipolar junction transistor (BJT) and the metal-oxide-semiconductor field-effect transistor (MOSFET).

**Key Characteristics:**

- Compact and lightweight.

- Low power consumption.
- Fast switching speed.
- Highly reliable and durable.
- Suitable for both analog and digital applications.

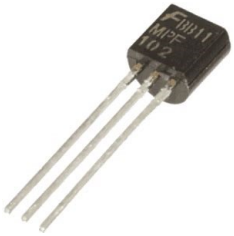
**Working Principle:**

Transistors rely on the controlled flow of electrons or holes through a semiconductor material. BJTs amplify current, whereas MOSFETs control voltage. By varying the input voltage or current, they can be used to amplify signals, switch loads, or perform various signal processing tasks.

**Applications:**

- Amplification in audio and radio frequency circuits.
- Digital logic gates in microprocessors and memory devices.
- Switching applications in power electronics.
- Signal processing in various electronic devices.

## Field Effect Transistors (FETs)



FETs are a subtype of transistors and are particularly important in low-power and high-impedance applications. The most common types of FETs are the metal-oxide-semiconductor FET (MOSFET) and the junction field-effect transistor (JFET). FETs have characteristics most similar to a triode vacuum tube.

**Key Characteristics:**

- High input impedance.
- Low power consumption.
- Excellent linearity.
- Suitable for low-frequency applications.
- Low noise operation.

**Working Principle:**

FETs control the flow of current through a semiconductor channel via an electric field. MOSFETs use voltage to modulate the channel, while JFETs use voltage to control the width of the channel. This modulation of the channel allows for precise control of the output current.

**Applications:**

- Low-noise amplification in high-impedance circuits.
- Switching applications in low-power devices.
- Voltage amplification in preamplifiers.
- Analog signal processing in audio and instrumentation.

## Triode Vacuum Tubes

Triode vacuum tubes are older electronic components that predate transistors. They consist of an evacuated glass envelope with three electrodes: the cathode, anode, and control grid. Vacuum triodes are larger, use current just to heat the filament and require higher voltages than transistors but they remain simpler to use in high-power amplifiers.

**Key Characteristics:**

- Large and heavy.
- High power consumption.
- High voltage operation.
- Produce harmonic distortion.
- Fragile and limited lifespan.

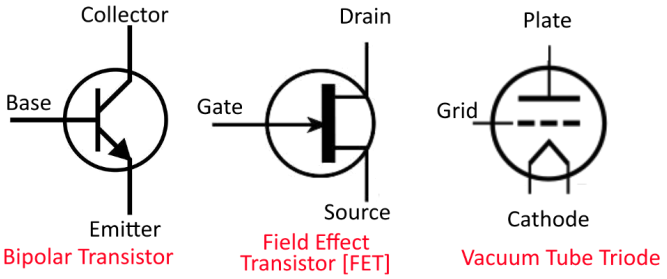
**Working Principle:**

Triode vacuum tubes operate by controlling the flow of electrons between the cathode and anode through the modulation of the control grid voltage. This allows for signal amplification and switching.

**Applications:**

- Early amplification in audio and radio systems.
- Used in vintage amplifiers.
- Historical use in computing and signal processing.
- High-power applications where transistor limitations are exceeded.

How do they compare?




| Device | Electrons Enter At | Controls Electron Flow | Electrons Leave |
|---|---|---|---|
| **Transistor** | Emitter | Base | Collector |
| **FET** | Source | Gate | Drain |
| **Vacuum Tube** | Cathode | Grid | Plate |

**Size and Weight:** Transistors and FETs are compact and lightweight, making them ideal for portable devices and miniaturized circuits. In contrast, triode vacuum tubes are significantly larger and heavier.

**Power Consumption:** Transistors and FETs have low power consumption, making them energy-efficient, whereas vacuum tubes are power-hungry.

**Reliability:** Transistors and FETs are highly reliable and have a longer lifespan. Vacuum tubes, on the other hand, are fragile and have limited operational life.

**Speed:** Transistors and FETs have fast switching speeds suitable for digital applications, while vacuum tubes are slower and better suited for analog applications.

**Linearity and Distortion:** FETs have excellent linearity and low distortion, while vacuum tubes introduce harmonic distortion in the amplified signal.

Transistors, Field Effect Transistors, and triode vacuum tubes each have their own unique characteristics and applications. Transistors and FETs are the standard choices for modern electronics, providing compactness, low power consumption, and high reliability. In contrast, triode vacuum tubes, with their vintage charm, are reserved for specific high-power audio applications and cases where their unique characteristics are desired. The choice between these technologies ultimately depends on the specific requirements and constraints of a given electronic circuit.

So, looking back at our sample questions,

**B**-4-5-1 What is one reason a triode vacuum tube might be used instead of a transistor in a circuit?

A. It may be able to handle higher power

Vacuum triodes are larger, use current just to heat the filament and require higher voltages than transistors BUT they remain simpler to use in HIGH-POWER amplifiers.

**B**-4-4-6 Which semiconductor device has characteristics most similar to a triode vacuum tube?

C. Field effect transistor

The triode and the FET both rely on a reverse voltage on their control electrodes to affect the current through the device.

*~ John VE7TI*

## Calling all New Amateurs: Get your Name in Lights!

Did you get your Amateur Radio certficate within the past year or two and want to introduce yourself through TCA to the Amateur Radio community? If so we would love to hear from you.

Drop a line to tcamag@yahoo.ca and tell us how you were introduced to the magic of Amateur Radio.

Do you credit any particular Amateur ("Elmer") with getting you started? Which aspect of the hobby do you enjoy so far?

Please be sure to include your name, call sign, date and level of certificate – and don't forget to include a photo or two. We hope to hear from you soon!

Our Radio Courses

Do you need more information about our courses?

https://bit.ly/RadioCourses

or scan the QR-code with your smart-device camera

Study Links for more information

Whether you are new to the hobby or brushing up on skills, you should find these study links helpful:

1. RIC-7 is the entire up-to-date Industry Canada (IC) Basic Question Bank. http://tinyurl.com/CanadaBasicQB
2. Industry Canada (ISED) on-line practice page: https://apc-cap.ic.gc.ca/pls/apc_anon/apeg_practice.practice_form
3. The Amateur Radio Exam Generator is at: https://www.ic.gc.ca/eic/site/025.nsf/eng/h_00040.html
4. The ExHaminer Study software for Windows is at: https://wp.rac.ca/exhaminer-v2-5/

Contact SARC if you wish to write the Basic or Advanced Exam. If you pass we'll even give you a year free as a SARC prospective member!

**Newly Licensed?** When you receive your paper license in the mail, it will come with a form that can be filled out and mailed to the Radio Amateurs of Canada office, at which point an introductory RAC one-year membership will be set up. Introductory memberships are identical to our existing basic memberships and you will receive The Canadian Amateur magazine for one year.

From Brian, a previous SARC Basic course student:

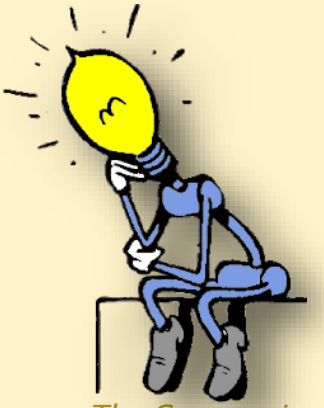
*Howdy John - hope all is well - i thought I'd let you know i just got my 700th HF contact today - and also i started on CW week or so ago - mostly hunting POTA and SOTA activations but it's sure helping my confidence on CW… got about 30 contacts on CW and they are getting better --- jus wanted to let you know you didn't waste all that time on me --- hope you and yours are well - take care Sir 73 dit dit*

# Those pesky block diagrams

More information needed? Click: https://bit.ly/SARCcourses

Our new students are often confused by the block diagrams for receivers and transmitters that are part of the Canadian Basic Amateur Radio Question Bank, and it is frequently mentioned in our course feedback as one of the more challenging lessons. As we have previously mentioned, there is a freeware program to practice assembling block diagrams called 'Ham Puzzle available as a free Windows download from Radio Amateurs of Canada at: https://www.rac.ca/wp-content/uploads/2014/04/HAMpuzzle/HAMpuzzle12.zip. It can also run under Wine on a Mac.

Even with Ham Puzzle our students continue to look for a better way to commit these block diagrams to memory. If you, or your club, are involved in instruction and you have a memory aid, we'd love to pass it on to our students.



*~ John VE7TI*
*VE7TI@myrac.ca*

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# basiccourse

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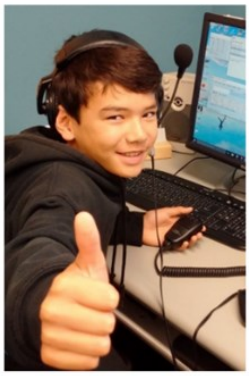
**Includes classes, a comprehensive manual, videos and the exam fee**



- Ideal for outdoors activities. Long range communications anywhere for free without commercial infrastructure
- Enhance your personal and your community's preparedness in an emergency
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- Use a radio, computer, smartphone or tablet for free worldwide voice and digital communications
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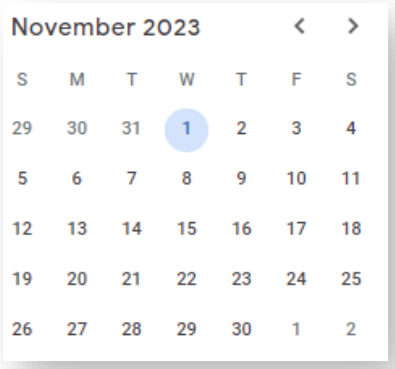
# NOVEMBER 2023

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| 29<br>CONTEST: CQ WW DX (SSB) | 30<br>19:00 On-line Basic Course | 31<br>Halloween<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | Nov 1<br>Look for the new SARC Commu | 2<br>20:00 GOTA Net | 3 | 4<br>07:30 Weekly Breakfast Meet<br>09:30 OTC Activation |
| 5<br>Daylight Saving Time ends | 6<br>19:00 Basic Course Review | 7<br>18:00 Basic Course Exam<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 8<br>19:00 SARC Monthly Meeting | 9<br>20:00 GOTA Net | 10 | 11<br>Repeater Roundabout<br>WAE DX Contest (RTTY)<br>Remembrance Day (regional hc<br>07:30 Weekly Breakfast Meet<br>2 more |
| 12<br>Repeater Roundabout<br>WAE DX Contest (RTTY) | 13 | 14<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 15 | 16<br>20:00 GOTA Net | 17 | 18<br>07:30 Weekly Breakfast Meet<br>09:30 OTC Activation |
| 19 | 20 | 21<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 22<br>19:00 SARC Exec Meeting | 23<br>20:00 GOTA Net | 24 | 25<br>Nov CQ WW DX Contest (CW)<br>07:30 Weekly Breakfast Meet<br>09:30 OTC GOTA Workshop |
| 26<br>Nov CQ WW DX Contest (CW) | 27 | 28<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 29 | 30<br>20:00 GOTA Net | Dec 1 | 2<br>07:30 Weekly Breakfast Meet<br>09:30 OTC Activation<br>11:30 SEPAR-SARC Christmas |



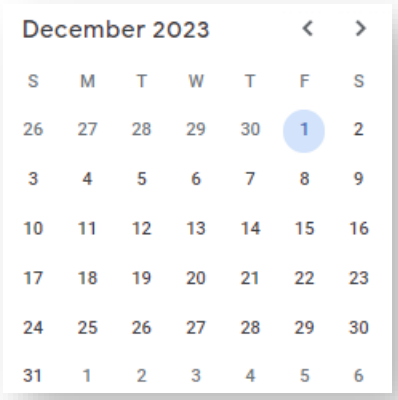

Event details: SARC—SEPAR 'Live' calendar link

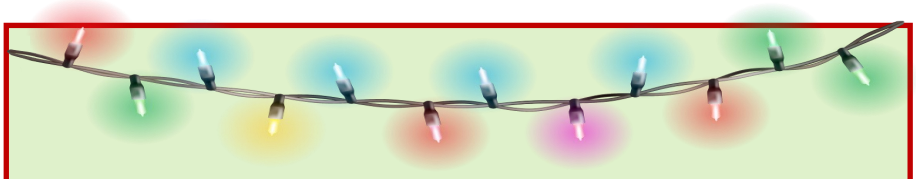
All contest information: WA7BNM Contest Calendar: Home

*A recent Saturday Denny's group. Come join us!*

# DECEMBER 2023

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| 26<br>Nov CQ WW DX Contest (CW) | 27 | 28<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 29 | 30<br>20:00 GOTA Net | Dec 1 | 2<br>07:30 Weekly Breakfast Meet<br>09:30 OTC Activation<br>11:00 SEPAR SARC Christmas |
| 3 | 4 | 5<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 6 | 7<br>20:00 GOTA Net | 8 | 9<br>07:30 Weekly Breakfast Meet<br>09:30 GOTA Workshop |
| 10 | 11<br>Anniversary of the Statute of W | 12<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 13 | 14<br>20:00 GOTA Net | 15 | 16<br>07:30 Weekly Breakfast Meet<br>09:30 OTC Activation |
| 17<br>ARRL Rookie Roundup (CW) | 18 | 19<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 20 | 21<br>20:00 GOTA Net | 22 | 23<br>07:30 Weekly Breakfast Meet<br>09:30 OTC Activation |
| 24<br>Christmas Eve | 25<br>Christmas Day | 26<br>Boxing Day (regional holiday)<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 27<br>19:00 SARC Exec Meeting | 28<br>20:00 GOTA Net | 29<br>16:00 RAC Winter Contest (CW, Phone) | 30<br>07:30 Weekly Breakfast Meet<br>09:30 OTC Activation |
| 31<br>New Year's Eve | Jan 1<br>Look for the new SARC Comm<br>New Year's Day | 2<br>Day After New Year's Day (Quel<br>19:30 SEPAR Net<br>20:00 SARC Weekly Net | 3 | 4<br>20:00 GOTA Net | 5 | 6<br>Epiphany<br>07:30 Weekly Breakfast Meet<br>09:30 OTC Activation |



*As we enter the holiday season, the Directors of Surrey Amateur Radio Communications would like to send you Season's Greetings! As we celebrate the joy and warmth of this time of year, may your home be filled with love, peace, and happiness.*

*May the New Year bring you new hopes, new aspirations, and new successes. Enjoy the festivities and cherish the moments with your loved ones. Happy Holidays and a prosperous New Year!*

# Radio-Active

# Profiles Of SARC Members

## Meet Dmitry Sevostiyanov  VA7DVO

coordinated by LARRY BLOOM VE7LXB

I was born and raised in Moscow, in the former Soviet Union and had a happy childhood. I was truly fortunate that my high school offered extended language programs. I studied German intensively and at the end of school became quite fluent in it. At the time the Soviet Union was opening its borders and I was fortunate to go on two school exchange trips to Western Germany. Since then, I have had remarkably close ties to Germany and even lived there for a year after getting my degree.

After High School, I studied Mechanical Engineering at Moscow State University of Graphic Arts. My dad was a Mechanical Engineer working on aircrafts, so my career choice was simple. The Soviet Union was going through significant political changes at the time, which made our lives very interesting (to put it politely). Like the old saying goes, 'May You Live in Interesting Times,' which can be both a blessing and a curse. While in University I took German classes in addition to the regular Engineering program and worked in the university's computer lab. I was too busy with my studies to recognize the scale of political and economical changes around me. The Free Market was booming, and the newly found feel of freedom was palpable. The country was opening to Western business, and big-name companies were rushing to get a foothold in the massive Russian market.

After getting my Engineering degree I applied to a German manufacturing company, which was rapidly expanding its presence in Russia. Fluency in German really helped me secure the position. As a first order of business my new employer sent me to Germany for a year. I lived in beautiful South-West Germany near Frankfurt and had a chance to meet people from all over the world. Two Canadians were a part of the new hires group with whom I had long conversations. My English was not great back then, which made conversations even longer, but I was

picking it up quickly. Learning a second foreign language was much easier than the first.

On my return to Moscow, I started working in the Engineering Support department and really enjoyed it. I was travelling a lot, and I always had a packed bag on standby. In fact, I have been to all major Russian and East European cities This gave me a new appreciation of the beauty and ruggedness of the rural Russia. At the time, the economical and political situation in Russia was quite challenging. I decided to look for an opportunity to move to another country. I was already familiar with Canada, so it became an easy choice. I put lots of effort into improving my English and soon applied for a Canadian Immigration Visa as a skilled immigrant.

It took a few years for my application to go through but I got my Visa in early 2000. At that point it hit me that I'm about to make the biggest change in my life. I was going to Canada on my own and everything was going to be different. New language, new customs, pristine environment. I told myself that at least the weather would be like Russia. Boy, was I wrong. In any event, I landed in Toronto in August of 2000. The airline lost half of my luggage, so I had to start my new life with next to nothing. Luckily for me, the Russian community in Toronto was very welcoming and gave me lots of help. By sheer luck, the same German company I worked for in Russia had a branch in Toronto. I called them and they hired me the same day. However, I had to start as an entry-level field technician. The good news - I had a job. The bad news - I had to travel all over the Toronto area, and that was before GPS! I was in shock for a few months from all the changes. It was difficult and stressful, but I have survived.

Finally, after two years in Canada I settled in and made quite a few good friends. My life was improving, but Toronto's weather was uncomfortable even though I had travelled to Siberia in the middle of the winter, In 2002 I visited a friend in Vancouver and fell in love with the city and the natural beauty surrounding it. It became my goal to move here. At the same time, the company I worked for was going through some turbulent changes. I decided to make two life changes at the same time - move to Vancouver and change my career path to Information Technology.

So off I went, driving the moving truck across Canada, which was an amazing experience, (discounting the truck breakdown.) Just past Calgary, in the middle of Rocky Mountains, the power steering failed and I barely managed to pull over. There was no cell signal, but there was a tourist information spot within walking distance. I called for help, the truck was fixed and I was on my way to BC.

I have called Vancouver home since 2002. I met my wife here and both of our boys were born in BC. After a year in college studying Information Technology, I got my first IT job at one of the Vancouver's ports. There I had my first exposure to wireless networks in a large outdoor environment and I have learned a lot about signal propagation, antennas, and interference. That was my introduction to radio, but with two young boys I had no time for hobbies. After 8 years at the port, I moved to another company, a well-known aircraft manufacturer. I have been with that company with 10 years now, still in Information Technology field, specializing in Information Security. I enjoy the challenges of a fast-paced work environment and am learning something new every day.

Next year my wife and I will be celebrating our 20th wedding anniversary and we are in the process of raising two teenage boys. Alex is a new HAM (VA7PVC), just like me, and he and I have done several radio contests together, and we recently

participated in the club's first POTA activation. My younger son Nick has other interests, at least for now. We all enjoy camping, kayaking, hiking and other outdoor adventures. My wife is not very adventurous, so overnight camping is only for the boys. Alex and I go on long bike rides and Nick and I play music together. He plays guitar and I make some noise on the bass. My wife and I both love music, and we enjoy going to concerts and other live music events.

As to how I got into ham radio, information technology and wireless networks gave me my first big exposure to radio. I was always interested in emergency communication for my camping trips, where the cell signal can be spotty. I also know how fragile the network infrastructure can be. There are many reasons why the Internet or cellular network may go down and I began considering ham radio as backup communications. Yet, after I joined SARC, I realized that ham radio is much more than just communication. I have met amazing people at the club. We've had contests, nets, classes, Christmas parties and BBQs together. I'm really blessed and thankful to be a part of the club.

In fact, I'm very interested in Parks On the Air, POTA. It combines my love of the outdoors and the radio. I have done several park activations myself and have decided to share what I have learned with the club. On September 16th, this year I put together a POTA workshop and the club had our first successful POTA activation. All of us had a lot of fun and we will do it again (weather permitting). I'm also very interested in digital communication. FT8 is my latest discovery, but there is so much more. I would really like to learn more about JS8Call and WSPR (whisper). As well, I'm currently learning Morse code. It's a bit challenging, but I do enjoy it.

As well, I have many hobbies outside of amateur radio. I like biking, kayaking, hiking, and camping. I'm also a devoted follower of the "Iceman" Wim Hof and swim in the ocean all year long. In fact, I took my first 'plunge' this year with the Polar Bear swim in White Rock. That was fun. The reaction from spectators is priceless when they see us jumping in the ocean in the middle of the winter. Alex is enjoying the cold plunges but Nick is not yet fully into it yet.

I enjoy playing music and play my bass guitar every evening. I'm not particularly good at it, but I enjoy playing, nonetheless. I also play drums and a few years ago I converted my acoustic drum set into an electronic one so I could play it without making much noise. That was a fun project and it got me into electronics. I'm quite handy and have done a lot of home improvements. I also enjoy working on small engines and have fixed countless lawn mowers, string trimmers and pressure washers for all my neighbors over the years. Having an Engineering background really helped, and I enjoy troubleshooting complex engine issues.

In conclusion, joining SARC and SEPAR was the highlight of the year for me. The club is doing cool things and the people I've met at the club are amazing. I have learned a lot, such as building a CW trainer which gave me my first real exposure to electronics. I certainly enjoy building things and I'm looking forward to other projects as I continue my ham journey.

~ *Dmitry VA7DVO*

# Another POTA Activation Adventure

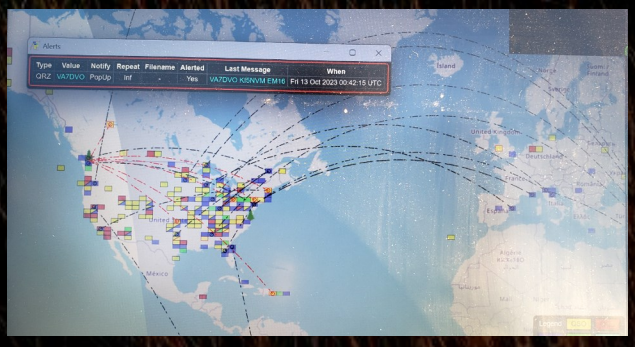
## Boundary Bay (Mud Bay) Park

by DMITRY SEVOSTIYANOV VA7DVO

Alex and I just came back from another successful POTA activation at our favourite spot, Boundary Bay (Mud Bay) park. We ran out of daylight, and could only do FT8. We got 19 contacts, mostly from the US but one from Chile. Almost got South Africa, but could not reach back to him. We used a 40 feet fiberglass mast with EFHW tuned for 20M on it. Antenna was right next to the salt water, so the contacts were plentiful today. We had to bike there, weight was an issue, but we had a successful portable operation.

Both of us had fun.

*~ Dmitry VA7DVO*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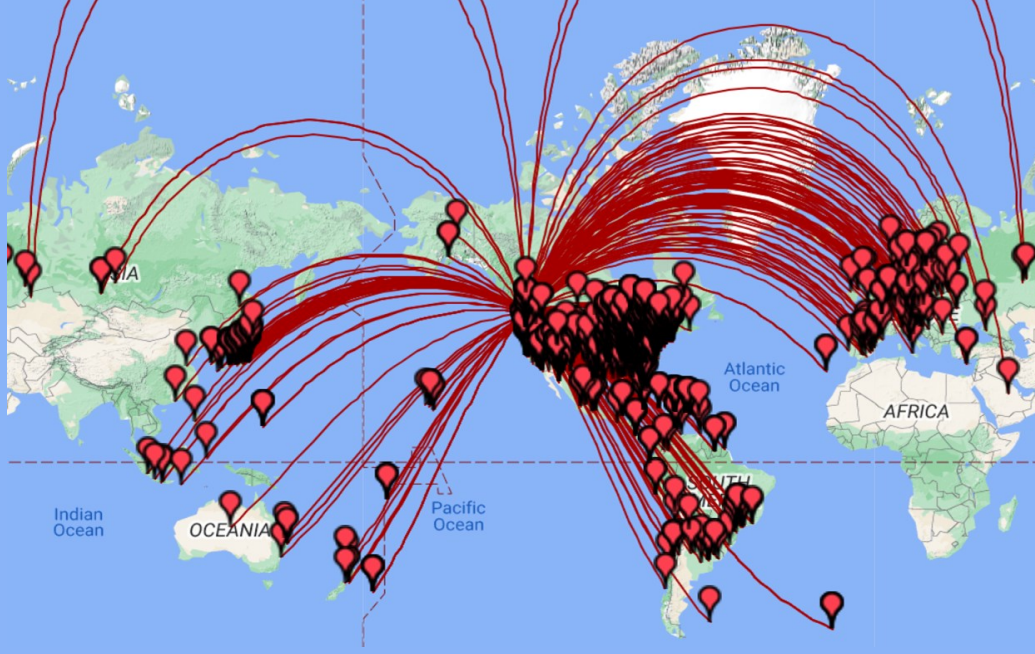
QRZ VA7DVO PopUp Inf - Yes VA7DVO K6NVM EM10 Fri 13 Oct 2023 00:42:15 UTC

# The Contest Contender




## CQ WW DX Contest (RTTY)

by JOHN BRODIE VA7XB

**JOHN BRODIE VA7XB** reporting on SARC's contesting efforts.

This was a milestone for SARC, in the sense that for the first time we had an enthusiastic team of rookies ready to join the pros and tackle a new mode.

The CQ WW DX Contest for RTTY took place on 23-24 Sept. Participants were Slawa VE7LWW, Mike VE7YEG, Doug VA7JDJ, Derek VE7VPG, and Dmitry VA7DVO. John VA7XB and John VE7TI assisted with coaching. Sorry we missed Larry and Andrew this time.

All of the RTTY "rookies" were able to get into the rhythm of tuning in the stations, log them on N1MM and make a total of 1094 contact and 75 countries as a team.

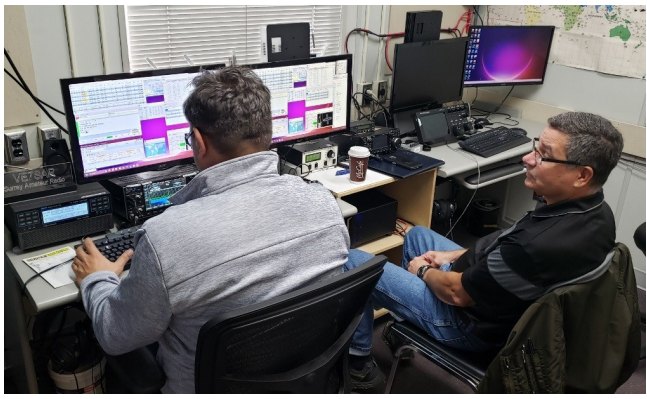
We were disappointed not to see more exotic DX, but that's the way it goes sometimes.

Slawa VE7LWW did all the heavy lifting at both the beginning and end, but some of us were able to watch the pro at work and learn.

Next big one is the SSB DX contest 28-29 October.

Thanks to all.

~ *John VA7XB*



# More Contest Contender

## CQ WW DX Contest (SSB)

The CQ WW DX Contest for SSB on the weekend of Oct. 27-28 represents the most serious effort we have put into SSB contesting of the DX variety. All the daylight and evening hours were filled by by enthusiastic members anxious to give it their best shot and polish their skills.

Our team was comprised of: Jan VA7VJ, Mike VE7YEG, Doug VA7JDJ, Derek VE7VPG, Manvir VA7BKI, Dmitry VA7DVO, Alex VA7PVC, Andrew VA7LGN, John VE7TI, Larry VE7LXB and John VA7XB. Some of this group had only done one or two contests previously, so this was another confidence-building exercise.

We operated one radio, the IC-7610 driving the Expert Linear amp, all pre-tuned to match either the 10-15-20m tribander or the 40-80m OCF dipole, now higher in the trees following recent work. Wav files were also pre-recorded and tested so the team could hit the road running.

To our pleasant surprise, during the opening hours of the contest, we found that 10m was wide open late Friday afternoon extending to about 8 pm, at which time the team moved to 15m and then 20m before the nighttime bands took over. Overall (and as usual), 15 and 20m were the most productive bands. Other than JA and the Caribbean, DX was rare on the lower bands.

Best contacts of the weekend were 4X1DX Israel (despite the war!), A60A United Arab Emirates, JT5DX Mongolia, and several of the African off-shore islands of Madeira, Canary and Azores.

| | 3.5 | 7 | 14 | 21 | 28 | Tot |
|---|---|---|---|---|---|---|
| Total | 2 | 169 | 383 | 428 | 104 | 1086 |

**North Korea shown in the table below would appear to be an error.*

John VE7TI reports that most of the potential contacts on Sunday afternoon were dupes, but during the last hour the pace picked up dramatically for a good finish.

What about the raised 80-40m antenna? The signal-to-noise ratio appeared to be improved somewhat. Stations from Japan, South Pacific and the Caribbean could be worked with some effort, but the remainder of the world was elusive, so we still have to consider the wire antenna as our DX weak spot.

What's up next? Let me know if you would like to work as a VE7SAR team or individually using your own callsign.

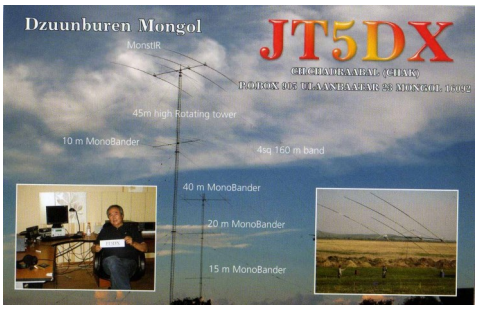
va7xb@myRAC.ca

- 11-12 Nov WAE DX Contest (RTTY)
- 25-26 Nov CQ WW DX Contest (CW)
- 17 Dec ARRL Rookie Roundup (CW)
- 30 Dec RAC Winter Contest (CW, phone)

~ *John VA7XB*

**VE7SAR - CN89OC**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3D2F | Fiji | 1 | 26 | FY | French Guiana | 2 | 51 | OM | Slovakia | 1 | 76 | VP2M | Montserrat | |
| 2 | 4X | Israel | 1 | 27 | G | England | 4 | 52 | ON | Belgium | 1 | 77 | VP5 | Turks and | |
| 3 | 5B | Cyprus | 1 | 28 | GM | Scotland | 3 | 53 | OZ | Denmark | 1 | 78 | VR | Hong Kong | |
| 4 | 5W | Samoa | 1 | 29 | HA | Hungary | 4 | 54 | P4 | Aruba | 2 | 79 | W | USA | |
| 5 | 6Y | Jamaica | 3 | 30 | HI | Dominican Republic | 5 | 55 | PA | Netherlands | 1 | 80 | XE | Mexico | |
| 6 | 8P | Barbados | 2 | 31 | HK | Colombia | 4 | 56 | PJ2 | Curacao | 4 | 81 | YB | Indonesia | |
| 7 | 9A | Croatia | 8 | 32 | HL | South Korea | 1 | 57 | PJ4 | Bonaire | 10 | 82 | YJ | Vanuatu | |
| 8 | 9M6 | East Malaysia | 2 | 33 | HM | North Korea | 1 | 58 | PY | Brazil | 52 | 83 | YL | Latvia | |
| 9 | A6 | United Arab Emirates | 1 | 34 | HR | Honduras | 2 | 59 | PZ | Suriname | 1 | 84 | YO | Romania | |
| 10 | BY | China | 4 | 35 | I | Italy | 17 | 60 | S5 | Slovenia | 9 | 85 | YU | Serbia | |
| 11 | CE | Chile | 15 | 36 | J6 | Saint Lucia | 4 | 61 | SP | Poland | 8 | 86 | YV | Venezuela | |
| 12 | CN | Morocco | 2 | 37 | JA | Japan | 104 | 62 | SV9 | Crete | 1 | 87 | ZF | Cayman Is | |
| 13 | CO | Cuba | 2 | 38 | JD1O | Ogasawara | 1 | 63 | T2 | Tuvalu | 1 | 88 | ZK1s | South Cook | |
| 14 | CT | Portugal | 2 | 39 | JT | Mongolia | 1 | 64 | TA | Turkey AS | 1 | 89 | ZL | New Zealar | |
| 15 | CT3 | Madeira | 2 | 40 | KH2 | Guam | 2 | 65 | TI | Costa Rica | 7 | 90 | ZL7 | Chatham Is | |
| 16 | CU | Azores | 1 | 41 | KH6 | Hawaii | 6 | 66 | UA | Russia EU | 4 | 91 | ZP | Paraguay | |
| 17 | CX | Uruguay | 3 | 42 | KL7 | Alaska | 7 | 67 | UA0 | Russia AS | 4 | | | | |
| 18 | DL | Deutschland | 15 | 43 | KP2 | Virgin Islands | 2 | 68 | UN | Kazakhstan | 2 | | | | |
| 19 | DU | Philippines | 2 | 44 | KP4 | Puerto Rico | 10 | 69 | UR | Ukraine | 5 | | | | |
| 20 | E7 | Bosnia and Herzegovina | 1 | 45 | LU | Argentina | 18 | 70 | V2 | Antigua and Barbuda | 3 | | | | |
| 21 | EA | Spain | 12 | 46 | LY | Lithuania | 1 | 71 | V3 | Belize | 1 | | | | |
| 22 | EA8 | Canary Islands | 4 | 47 | LZ | Bulgaria | 1 | 72 | V4 | Saint Kitts and Nevis | 3 | | | | |
| 23 | EU | Belarus | 2 | 48 | OE | Austria | 3 | 73 | V6 | Federated States of Micronesia | 1 | | | | |
| 24 | F | France | 4 | 49 | OH | Finland | 5 | 74 | VE | Canada | 15 | | | | |
| 25 | FM | Martinique | 3 | 50 | OK | Czech Rep. | 2 | 75 | VK | Australia | 15 | | | | |



# Two 2m QSO Contests

There are not one, but two VHF contests on the November 11th holiday weekend. These should be easy to work for both beginners and experienced hams alike.

## 2m QSO Party

Saturday 2023-11-11  10:00 – 14:30 (Pacific Time - Vancouver)

https://wp.rac.ca/144-mhz-2m-page/

Contest is open to all certified amateurs. Each QSO must have one station within Metro Vancouver, Vancouver and Gulf Islands, Southwest BC (Grids CN79, CN89 and CN99) or Northwest WA (only Grid Squares along the Canada-USA border: CN78, CN88, CN98) in order to be considered for points.

Valid FM operating frequencies include 146.415, 146.430, 146.445, 146.460, 146.475, 146.490, 146.505, 146.535, 146.550, 146.565, 146.580, 146.595, 147.420, 147.450, 147.480, 147.510, 147.540, 147.570 MHz. Valid SSB operating frequencies are between 144.200 and 144.275.

And…

## The Repeater Roundabout

The Repeater Roundabout is a weekend-long event held on many of NW Washington's nearby repeaters. The goal is to meet new people and work repeaters you might not usually key up. It's also a great way to get started with ham radio contests for folk who are primarily repeater users. Light up the airwaves and make some noise on the great repeaters in the Puget Sound area, with a decent antenna and some height, most from Seattle north are accessible to us in southwest BC!

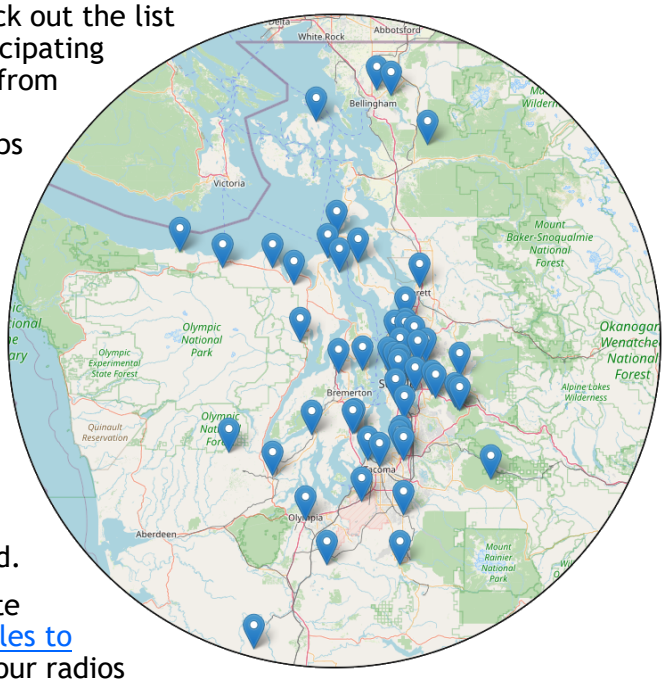
The Repeater Roundabout will begin on November 11th, 2023 at 00:00, and end on November 12th, 2023 at 23:59, Pacific time.

Anyone with a ham radio license can participate ! You don't even have to be local; stations may participate over Echolink, Allstar, or IRLP if they are available.

### Joining the Repeater Roundabout

To get started, check out the Rules page.

Then, check out the list of 91 participating repeaters from across 43 radio groups that you'll play on during the contest. You can also view the map to see where the repeaters are located.




The website provides files to program your radios with CHiRP and other software.

Visit their logging page to log your contacts and submit your logs for scoring.

Join their Discord chat server to chat with other participants, arrange skeds, and get help.

~

# The OTC report

## Raising the dipole

### We activate Saturday mornings 9:30am—noon

by JOHN BRODIE VA7XB

**JOHN BRODIE VA7XB** reporting on our SEPAR Operations and Training Centre.

Our Operations and Training Centre ("OTC") is where SARC and SEPAR carry out activities for the benefit of our members and the community we serve. On any given Saturday morning between 10am and 12pm, a visitor may be surprised to find classes or workshops underway, exams being supervised, elmering of members' radio issues, facility maintenance and contesting all going on simultaneously. It is normal to have 15-20 members show up for these activities or just socializing after the club breakfast.

For example, on the weekend of Oct. 21/22, SARC hosted a soldering workshop open to both new and old members, cleaning of the roof to remove leaves and debris to keep the drains free, as well as a work party to modify our HF wire antenna. It is the last of which I wish to speak because the compromised position of our antenna for 40 and 80m has been a source of frustration since the earliest days at this facility.

Not only was the antenna insufficiently high for these bands, but the wire which partially hung low over the building itself was susceptible to RFI from the lights and electronic devices within the building. This made for a high noise level on the radios, and thus working DX very challenging, if not virtually impossible.

We are blessed to have an abundance of tall trees on the north, and undeveloped, side of the facility but

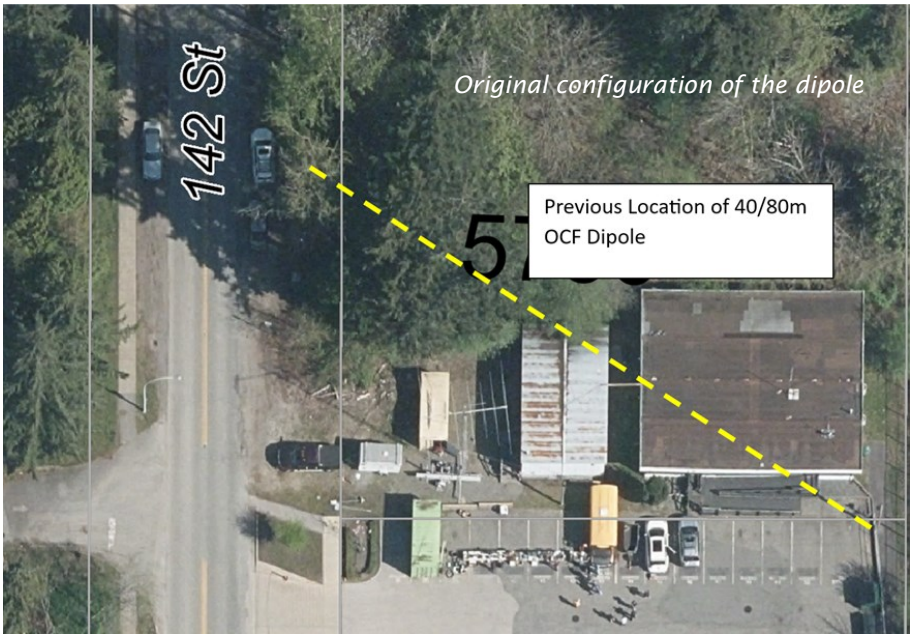
the blessing is mixed because suitable trees are mostly in the wrong places and hidden amongst a tangle of lower deciduous scrub alder and cottonwood.

Before the recent changes, our 40-80 off centre-fed (OCF) dipole antenna could be described more accurately as a "sloper" with one end attached by rope and pulley to a conifer at ~25m height with the other end connected to a light pole at ~7 m height, also through a pulley.

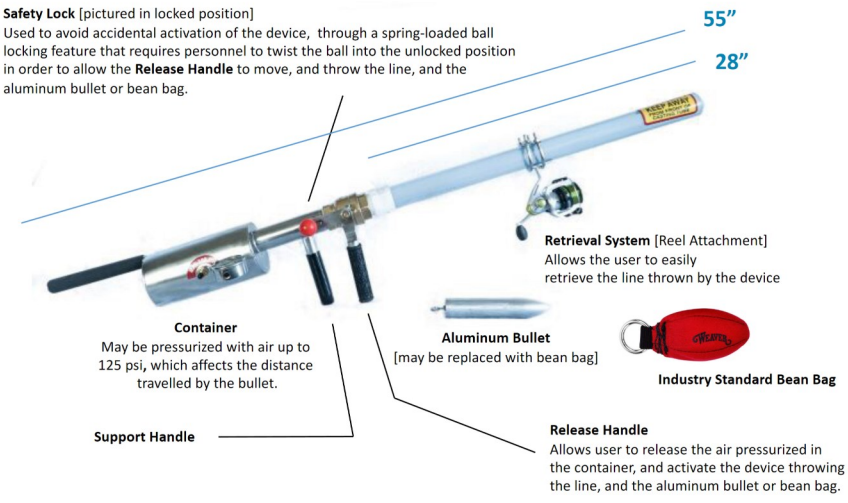
The only other suitable tall tree for our purpose was located in a position beyond the reach of our air cannon, which is limited to shooting a height of about 80 ft.

No solution was forthcoming until new member, Derek VE7VPG, came along and offered use of his arborist's cannon. This device, called a DTX Shoulder Shot Tree Toppler, is constructed with a long barrel and a stainless steel tank which can be pressurized to max. 125 psi with a hand pump. In addition, the cannon deploys a 12 oz "beanbag" weight, which fits snugly in the barrel so pressurized air does not escape when shooting. The weight is sufficiently heavy and streamlined in shape to drop with some force through branches when it falls. The tree toppler is reputed to be capable of throwing the weight and line up to 250 ft. We decided it was worth a try to get a rope over the tree in question.

After a couple practice tries, up went the beanbag, over the desired high branch and dropping down to the ground. A 200 ft. length of 600 lb parachute cord was fastened to the weight, then hoisted up from the shooter's end. Once the cord




was retrieved, the antenna was partially lowered and the cord was attached to the balun. The plan was to pull the balun up with the new cord, at the same time loosening it from its attachment points at the far ends of the antenna to allow it to rise. This necessarily gave the wire somewhat of a Vee shape oriented toward the south, but now much higher.


Safety Lock [pictured in locked position]
Used to avoid accidental activation of the device, through a spring-loaded ball locking feature that requires personnel to twist the ball into the unlocked position in order to allow the Release Handle to move, and throw the line, and the aluminum bullet or bean bag.
55"
28"
Retrieval System [Reel Attachment]
Allows the user to easily retrieve the line thrown by the device
Container
May be pressurized with air up to 125 psi, which affects the distance travelled by the bullet.
Aluminum Bullet
[may be replaced with bean bag]
Industry Standard Bean Bag
Support Handle
Release Handle
Allows user to release the air pressurized in the container, and activate the device throwing the line, and the aluminum bullet or bean bag.

*Derek VE7VPG shooting a line over the target tree from the roof of the OTC, with John VA7XB standing by. Deciduous brush in the foreground created a hangup problem when raising the wire, but the crew was successful in the end.*

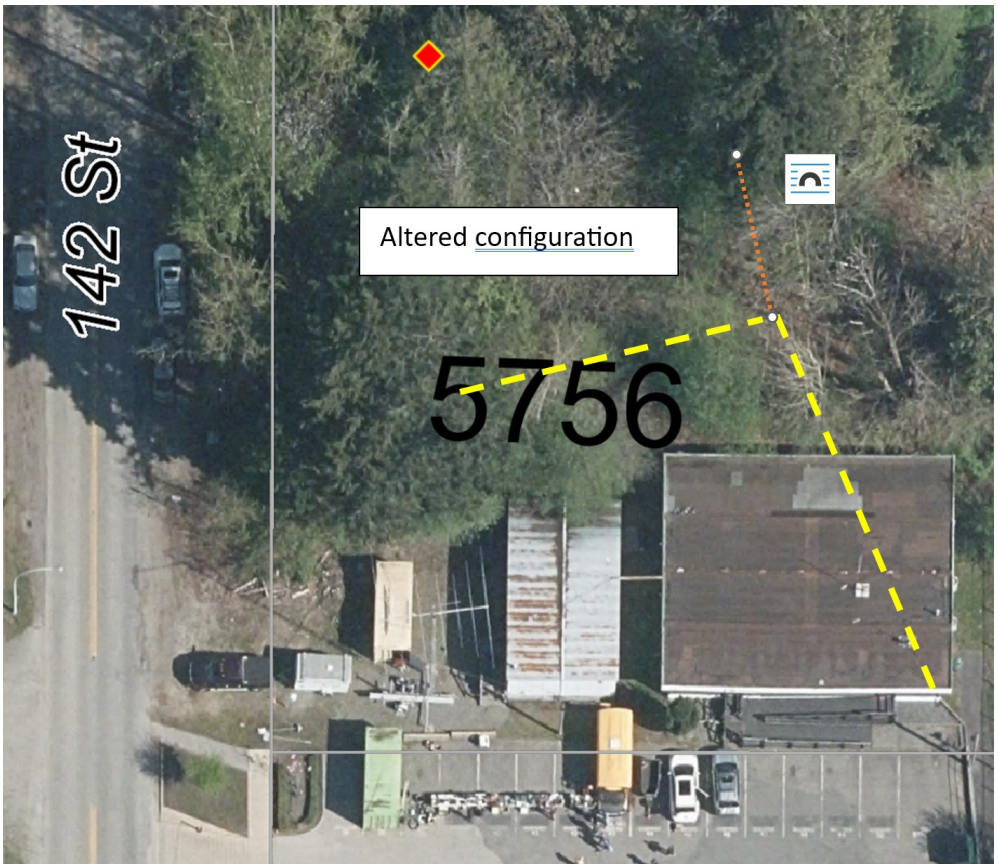
This image shows a fishing reel type retrieval system but Derek's device did not have it, rather the stiffline was allowed to play out from a wide mouthed bag at his feet.

At the time of purchase, the total price for the tree toppler and accessories (12 oz throw weight, 100m Stiffline, and folding storage bag) was C$480 plus tax purchased from The Arborist Store, Port Coquitlam, BC. but the cost has recently increased by ~ C$100.

In checking the swr afterwards, we (predictably) found the swr curve to have changed. Yet swr was still below 3:1 over the entire 40m and 80m bands and thus tunable. Without modeling, the new propagation pattern is yet unknown.

So how does it work? We found out during the CQ WW DX Contest for SSB on the following weekend. See the separate report on that.

~ *John VA7XB*




*Altered configuration after pulling the balun towards the high tree*

# SARC news…

# A basic soldering workshop

On Saturday, October 21st we held our first SARC Basic Soldering Workshop at the OTC. The idea came about when one of our recent basic course graduates asked about soldering connectors and coax. In several chats that followed it seemed that a logical solution was to start with basic soldering techniques, the most applicable of which would include circuit boards. Given the time of year, we decided on a reasonably simple 3D flashing LED Christmas tree, a sample of which instantly attracted even non kit builders.

The 20 kits arrived from China within two weeks and, after a quick translation of the instructions, we were ready to go. Larry VE7LXB looked after the workshop logistics while Dino VE7NX, Robert VA7FMR and I looked after instruction, supervision and assistance. In the end, and despite a few bridged and cold solder joints, all the kits worked and will no doubt be shown off during the coming season. Interest exceeded available seats, so a second (and perhaps annual) workshop is planned.

*See the additional article starting on page 35.*

*~ John VE7TI*

# more SARC news…

*SARC was at the Delta Swap Meet on Sunday, October 15th. We didn't have many club goodies left to sell but several members brought their once-upon-a-time treasures.*

## Gary VE7GPR has a new antenna

*Here's Lesley my 'model' posing with the Hustler 5BTV antenna.*

*Larry Thompson VE7LGT assisted with the cement work for the base post.*

*Originally I had the antenna mount on the post holding up our aluminum deck awning. This included a DX Engineering stainless "swing " mount. But… it was too high for me to have enough leverage to swing it in position for use. So in the end it was an advantage to actually mount it in its current position as it allows me to swing it down between the house when not in use. The neighbour had a good chuckle. Next is to put a ground stake beside the antenna mount as well to perhaps run a few ground radials from the base.. next year if I get the driveway paved with concrete I hope to attach ground planning to the re-bar as well. I moved the 2m/70cm antenna to the opposite side of the awning about 30 feet away from the HF antenna. Likewise I will add a ground stake there too. In the end I will have 3 ground stakes at the antennas and outside my basement window. These will all be bonded together. Lightning arrestors are placed at the stakes. Fun times!*

*Gary VE7GPR*

## *Reprint Policies*

These are policies for reprints from The Communicator, a bi-monthly journal about amateur radio and other topics published by Surrey Amateur Radio Communications (SARC).

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## *We welcome your comments and feedback*

Please consider leaving a comment via email to communicator@ve7sar.net, or on our blog site https://ve7sar.blogspot.ca or, better yet, contact our authors directly, so they know someone is out there reading our publication.

### *Social Reminder*

The Saturday weekly social gathering is once again 'on' at the Denny's Restaurant, 6850 King George Blvd., Surrey BC from 07:30—09:30. All are invited. Afterwards, we will host workshops and will be available to invigilate Amateur Radio exams at the OTC, 5756—142 Street, Surrey from 10-noon.

Bring your ham issues, our Elmers will try to help you sort them out.

September 2023

# SARC General Meeting minutes

September 13, 2023

Recording Secretary JEREMY MORSE VE7TMY

**SARC General Meeting Minutes 23.09.13**

**Attendees**: 29

**Start Time**: 7:00pm

**Location**: Surrey Fire Training Centre

## Introduction

- Welcome by Steve McLean VE7SXM
- Scheduled Presentation given by Dino VE7XDT on:
- GPS NTP Server – 10 kits planned
- WSPR Project – 10 kits in progress
- Dimitry VA7DVO – SOTA discussion and plan for upcoming event

## *Business meeting*

## Announcements

- Delta ARS swap meet Oct. 15 – we should reserve 1-2 tables
- October General Meeting – Halden VE7UTS on wire beam for SOTA, to be held in-person at Surrey Fire Training Center 64th Ave
- Saturday Breakfast and OTC Open House 7:30am – 9:30am at Denny's Restaurant 6850 King George Blvd. followed by OTC 5756-142nd Street open from 10am to 12pm.
- Anton unable to do coffee duties at Oct 11 general meeting

**Net:** Gary is unable to perform net control this month due to CW Course. Reg to assist in finding replacement.

## Committee Reports

**Financial Report (Steve VA7SXM)**

- We have moved to Coast Capital Savings for our Banking
- E-Transfers are now available sent to: payments@ve7sar.net. Please clearly state the purpose of the payment – receiving e-

transfer is free to the club, unlike PayPal which costs about 3.5%

- PayPal is still also available, as is payment by Cheque or cash
- Balance Sheet & Profit/Loss sheets up to end of August were presented

**Nets - (Reg - VA7ZEB)**

- Larry is replacing Rob VE7CZ as net controller. Thanks Rob for years of service.
- Net script improvements are being discussed

**SEPAR - (Gord - VA7GK)**

- Overview of SEPAR volunteers and encouragement for new members to join.
- 4th Tuesday of the month needs a net controller. Paul VE7VP is interested?
- A simple RCMP background check is required to signup for SEPAR.

**OTC - (Gord - VA7GK)** minimal changes over summer

**GOTA/Elmers - (Larry - VE7LXB)**

- 6 workshops held since the last meeting.
- Soldering workshop towards the end of Oct.

**Membership - (John - VA7XB)**

- Membership is 112 fully paid members. 15 did not renew but this is typical. We also have several hundred ham class members and grads with 1 year free membership (provisional members)

**Contests - (John - VA7XB)** – other than Canada Day Contest and Rookie Roundup (RTTY) we were not active as a group over the summer, but some individuals ran contests on their own. Fall contests include:

- Sept 16-17 - WA State Salmon Run (CW, phone)
- Sept 23-24 - CQ WW DX Contest (RTTY)
- Oct 28-29 - CQ WW DX Contest (SSB)

**Repeaters Status - (Steve - VE7SXM)**

- No recent complaints on North repeater
- We may be able to enhance antennas on the South repeater.

**Ham Class Training for 2023 (John - VE7TI)**

- New class started this week with 24 students
- CW Class starts 7pm Sept 19th (Stan - VA7NF)

**Surrey Run (John – VE7TI and others)**

- We were much more organized than last year, still some issues require improvement for next year.
- Gord provided an update from the EOC and how well the volunteers from SEPAR performed.

## Old Business

**Projects in the works:**

- Additional upgrades to Bigfoot tower include replacement of propane lines and regulators, filling of bottles and provision of 220v outlet.
- Cleanup and upgrades to SEPAR trailer are in progress including stabilizers, equipment reorganizing

## New Business

**Christmas Lunch** – Many attending the meeting expressed interest but more discussion at the board meeting is needed on the format (at OTC or formal etc)

**Talents and Resources** – a survey will be sent out to members

**Website—Jeremy** has the New SARC shared calendar embedded. Paul was unable to add it to his calendar. Jeremy to review.

**Adjournment** - (Steve VE7SXM) 9:16 pm

*~ Minutes prepared by Jeremy Morse VE7TMY*

October 2023

# SARC General Meeting minutes

October 11, 2023

Recording Secretary JEREMY MORSE VE7TMY

**SARC General Meeting Minutes 23.10.11**

**Attendees**: 20

**Start Time**: 7:00pm

**Location**: Surrey Fire Training Centre

## Welcome

- Welcome by Steve McLean VE7SXM

## Presentation

- Halden Field VE7UTS on Wire Beam Antenna for SOTA/POTA

## Announcements

- Delta ARS swap meet Oct. 15 - Gord, Doug volunteer to help
- Nov. General Meeting - Les will speak on baluns
- Saturday Breakfast and OTC Open House - 7:30am – 9:30am with OTC to follow from 10am to 12pm

## Committee Reports

**Financial Report** (Steve VA7SXM)

- Balance Sheet & Profit/Loss sheets presented.
- We are moving to Coast Capital Savings for our Banking
- E-Transfers are now available: payments@ve7sar.net
- Receiving e-transfer are free to the club, unlike PayPal which costs about 3.5%
- PayPal is still also available, as is payment by Cheque or cash
- Nets (Reg - VA7ZEB absent) - No update

**SEPAR** (Gord VA7GK)

- Thurs Oct 19th at 10:19am “The Great BC Shakeout” event is planned. After the drop and cover exercise join us on SEPAR repeater for an emergency exercise. Email will be sent out shortly.

**OTC** (Gord VA7GK) Portable antenna tower at OTC issues to be discussed later.

**GOTA/Elmers** (Larry VE7LXB)

- 1st Saturday in Dec 2nd there is a ??type?? workshop

**Membership** (John VA7XB absent)

- Membership is at 111 fully paid members.

**Contests** - (John VA7XB absent)

- CQ WW DX Contest (SSB) 28-29 October 2023, starting at 5 pm on Oct. 27.
- Both seasoned SARC DXers and GOTA newbies are invited to participate as a VE7SAR team.
- Coaching will be available for those new to contesting. If conditions are good, we can expect to make contacts with nearly 100 countries all over the world.
- Whether we operate two radios as Multi-Two (low power) or one radio as Multi-One (high power) will depend on the number of operators signed up.
- Both Larry (ve7lxb@gmail.com) and John VA7XB (brodiejb@shaw.ca) will collect names of those who wish to participate. We will be putting together an operating schedule this week.
- If you are a seasoned contester and can assist with coaching we also need to hear from you.

**Repeaters Status** - (Steve - VE7SXM) - no recent complaints.

**Ham Class** (John - VE7TI)

- We are halfway through the current course. Exams will be in mid Nov.
- Next course starts Jan 15
- Antenna workshop last Saturday and upcoming Saturday 9am-12pm
- John S. Soldering workshop planned for Oct 21 8:30am. 14 are registered and a waiting list has started for the next workshop.
- Current Ham class has a Surrey high school teacher as a student and is interested in getting his students interested in the course.

**CW Class** (Stan - VA7NF) - started Sept 19

- Week 4 this week and good progress is being made. Anticipating exams in a few weeks. 10 students attending.

## Old Business

**Projects in the works**

- **Grey Tower** - West anchor has been removed as the green container taken away. The tower has been lowered temporarily.
- We need to start OTC roof cleaning as the roof drains tend to plug up this time of year
- Stan has added a wire loop antenna behind the OTC for a receive antenna
- **Christmas Lunch** - Saturday Dec 2/2023 11:30am will be at the OTC.
- Options are cater or pot luck
- If you have decorations to donate or lend let Larry know
- **Talent and Resources Survey** - Expect to see an email on this shortly

## New Business

**QSL Bureau**

- Shawn Dooley VE7BD volunteered to collect cards for members and will contact Ken Clarke
- John S. moved that we provide Ken Clarke $25 and supplement as needed. Seconded by Gord. Carried
- If you're interested in receiving QSL cards you can reply to an email that will be sent to membership soon

**SEPAR** - Gord

- Presentation for emergency preparedness for LDS church this year. Nov 25 Saturday exercise and we are looking for some volunteers that can participate from your own home. Simulation of emergency communications between Richmond/Langley.

**Meeting adjourned** at: 9:37pm

*~ Minutes prepared by Jeremy Morse VE7TMY*

*Our October general meeting: Halden VE7UTS speaking about his wire Yagi antenna.*

# Reg VA7ZEB likes digital SWR meters

I use three. I'll list them, but keep in mind that I prefer digital generally, which is not the same as everyone else's taste. Many prefer the two-needle meters which I also like, but digital is my first choice. I really value having the exact numbers for forward and reflected power, even more than the actual SWR number. For instance, on last night's net, I noticed the SWR on one of my Kenwoods was up to 1.49 and I thought "I better take a look at that" before seeing that, at 30 watts, reflected power was under 2 watts which isn't going to damage anything. To each their own as we say so often in ham.

I bought this Nissei digital *[top photo]* on AliExpress and that's my "main" meter that I keep connected to my Icom VHF radio. It does HF and VHF/UHF (separate antenna connectors for each). It was $210 CAD landed at my door. No complaints at all so far other than possibly it is so light it is hard to keep in position.

I also bought this VHF/UHF (no HF) *[centre photo]* meter on Amazon for $56 and it has been gold. The only negative is the SMA connectors which are great for HTs but need adapters for mobiles. It has a built-in battery with USB charging. I have two of these, each connected to my Kenwood VHF/UHF and 220 radios respectively. I have to remember to keep them charged, but as I only turn them on when I'm in front of the radios, a charge lasts for months.

https://www.amazon.ca/gp/product/B08ZC7HS75/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Finally, for the go-bag, I bought this Nissei analog meter *[bottom photo]* (I wanted one with no battery for the go-bag). Again, it has been perfect. It's not a two-needle meter but it doesn't require calibration. It's only VHF/UHF but they make an HF version. It's currently $56 on AliExpress which is less than I paid by about $15. Tempting to buy another at that price but I don't want to become a junk collector.

https://www.aliexpress.com/item/1005003489300109.html?spm=a2g0o.order_list.order_list_main.91.21ef1802MqMPRr

I would absolutely recommend that you shop all the alternative marketplaces for an SWR meter as the Radioworld and GPS Central prices have gone insane. $400+ is normal there.

*~ Reg VA7ZEB*

# SEPAR

## Family & neighbourhood communications

by GORD KIRK VA7GK

Fall has finally arrived. The long very dry summer has ended and the fall winds and rain have started. For many of us it is time to put away the summer garden and prepare the outside for winter. For many amateurs the time to do any outside antenna work etc. is rapidly disappearing. Our work at the Operations and Training Center (OTC) this last weekend involved blowing the leaves off the building roof and checking that the downspouts were not plugged. In the past, lack of this maintenance has caused leaks inside the building. This is now a planned fall work activity we do as part of the building maintenance.

We also spent some time moving our wire dipole antenna up higher. One of the group brought his arborist throw line air cannon and helped "shoot" a pull line about 60 feet up a nearby tree. With a new line in the middle of the antenna (near the balun) we were able with a bit of work pull the middle of the antenna up higher.

One other area of unanticipated work was moving one of the guy lines off our trailer tower to a new concrete block location. The original location was anchored to the corner of a nearby shipping container. However the container owner was removing the container so we had to temporarily remove the line and crank down the tower until a new anchor location was decided and set up. With the work all done for the day our antennas were back in service, hopefully for the coming fall and winter.

**Gord Kirk VA7GK** is a SARC Director and the SEPAR Coordinator

SEPAR also participated in the annual Great Shakeout Earthquake exercise. Similar to previous year's we "dropped, covered, and held on" wherever we were at. After doing what we have planned to do (check our family for injuries, home or business for damage etc.) our plan is to go to the VE7RSC repeater. If this fails we go to the Surrey primary simplex frequency we would use.

While this is the plan for SEPAR it is open to any amateur radio operator. We start a net and ask those checking in for some basic information:

- call sign
- location
- injuries or immediate assistance required
- obvious visible damage or location report
- and the amateurs capabilities:
  - do they have power,
  - internet,
  - phone,
  - what type of radio do they have available with them (VHF/UHF/HF/Digital),
  - and also backup power, and
  - If the person checking in is mobile what have they seen during their drive.

Net control will gather this information and pass this "picture" on to the city or to another amateur who will take over the net.

So similar to previous years this is what was done this year. We had approximately 25 check-ins from around both the city and neighbouring areas. We also reached out to Whatcom County EOC in Washington State. They are the immediate southern border county to Surrey.

Prior to this exercise we had quite a discussion surrounding what a Volunteer was to do during an unplanned event. We discussed the plan about starting a net and who was to do it? The answer is the first person on the air. So we explained how our weekly net is a good example of how to run it.

We also practice a simplex portion of the net weekly. This should help members understand who they can normally "hear" and how to use a "relay station" to communicate with those who you cannot reach directly (or without a repeater in the middle). This is also a good lesson for many to help them understand that a good antenna and a mobile/base radio is better than having just a handheld with the stock antenna. Of course a handheld with a good antenna is also a great tool to have with you. As part of the radio licensing classes offered we hold a workshop and have the students make a roll-up j-pole. This helps make a small portable radio kit that you can keep with you in a bag at work, or your pack you take to work regularly etc. Regardless of the radio used, those who are regular participants in nets with their equipment quickly understand their limitations of their equipment.

Our discussion also led to a plan to create an emergency preamble to the net that can be used in place of the weekly "practice" net. The regular net script was sent out to a group for feedback to update it if needed. During the net the "new" net control made a sheet to help remind him of the information that would be important to gather. It will become the start of a template others can use moving forward.

As a follow up we will map out the approximate locations of each check in to show the capabilities of the amateur community to provide within 30 minutes or so of an earthquake.

We will also be looking at how we can get this information into the EOC prior to moving our net control to the radio room there.

We also had the local frequency plan which is agreed upon by the Greater Vancouver Area Municipalities' volunteer groups refreshed and it was sent out to the new amateurs who have been participating in the local GOTA net.

As we meet and debrief from the exercise there will no doubt be other learnings and outcomes we have not yet identified.

As I started this article talking about fall activities around the house there are some other personal things everyone should consider as personal preparedness items as winter approaches.

Winter Storms often impact power and the ability to travel.

Have you a plan for back up power and tested your plan? e.g. run the generator and make sure it starts. Do you have fuel? Are your radio batteries charged?

If your power goes out will you lose your heat? How about your internet and communications?

Do you have your vehicle prepared for winter with appropriate tires? What about winter supplies if you get stuck?

Have you changed out the summer clothing to winter clothing in your 72-hour kit?

Now is the time to gather those extra supplies, and think through what you learned last winter.

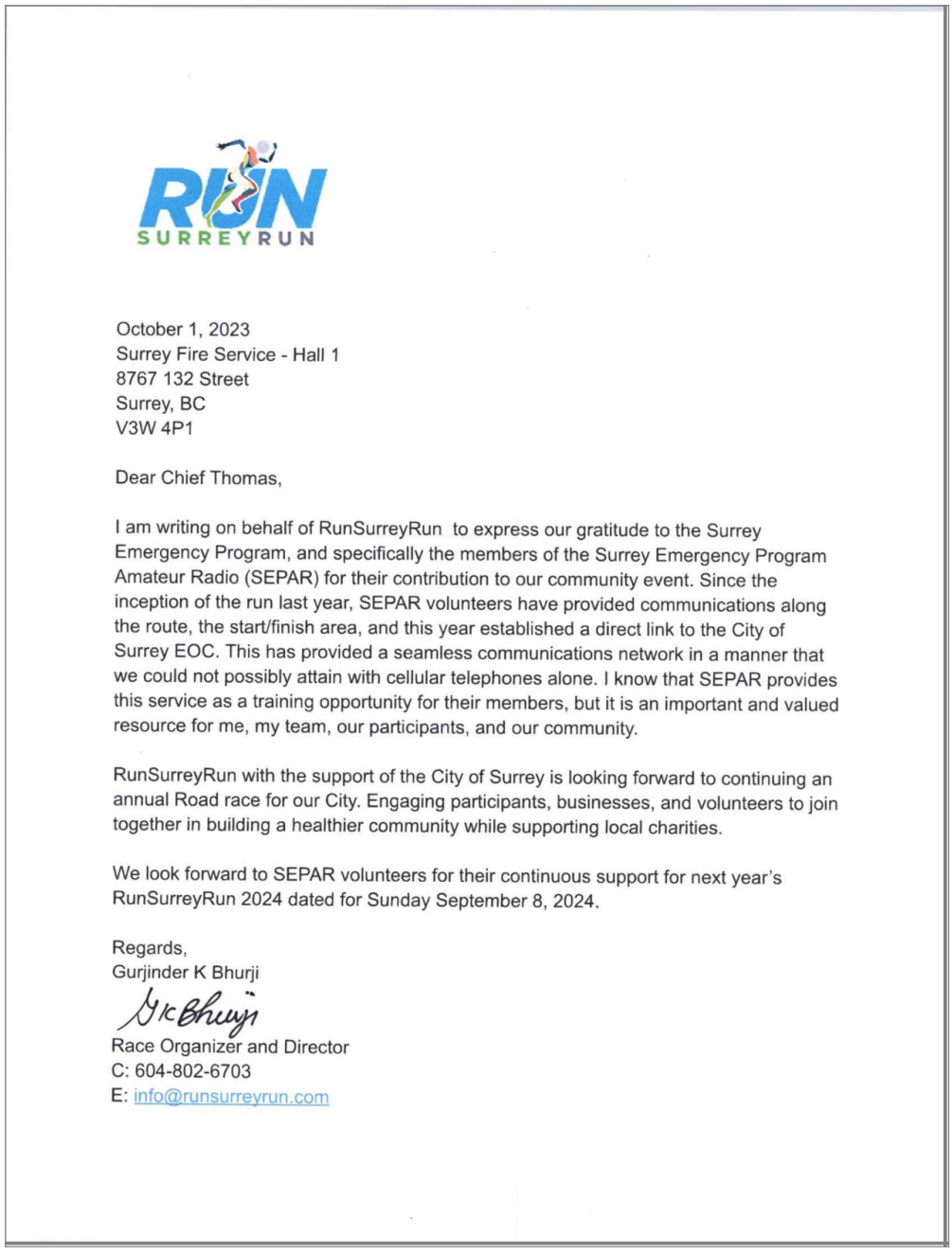
One last area is make sure you sign up for your local area alerts. In Surrey we use the Alertable App for emergency communications. You can define the alerts you will receive and be aware of storms or other emergencies that could impact you.

If you are interested in the SEPAR program and wish to become more involved please let us know. Our website is www.ve7sar.net and there is a contact information to get in touch with us.

You can also check out the blog at www.SEPAR.ca

Our weekly nets are every Tuesday night on the SARC repeater on 147.360 + T110.9 at 07:30 pm PST. All are welcome to check in.

*~ Gord Kirk VA7GK*
*SEPAR Coordinator*



RUN SURREYRUN

October 1, 2023
Surrey Fire Service - Hall 1
8767 132 Street
Surrey, BC
V3W 4P1

Dear Chief Thomas,

I am writing on behalf of RunSurreyRun to express our gratitude to the Surrey Emergency Program, and specifically the members of the Surrey Emergency Program Amateur Radio (SEPAR) for their contribution to our community event. Since the inception of the run last year, SEPAR volunteers have provided communications along the route, the start/finish area, and this year established a direct link to the City of Surrey EOC. This has provided a seamless communications network in a manner that we could not possibly attain with cellular telephones alone. I know that SEPAR provides this service as a training opportunity for their members, but it is an important and valued resource for me, my team, our participants, and our community.

RunSurreyRun with the support of the City of Surrey is looking forward to continuing an annual Road race for our City. Engaging participants, businesses, and volunteers to join together in building a healthier community while supporting local charities.

We look forward to SEPAR volunteers for their continuous support for next year's RunSurreyRun 2024 dated for Sunday September 8, 2024.

Regards,
Gurjinder K Bhurji
Race Organizer and Director
C: 604-802-6703
E: info@runsurreyrun.com

*As the year draws to a close, we want to take a moment to express our heartfelt gratitude for your dedication and contributions to SEPAR. Your passion for amateur radio has not only enriched our community but also made a significant impact in promoting this wonderful hobby.*

*This past year has been filled with challenges, but it was also a year of growth and learning. We have seen remarkable progress in our program, and it's all thanks to your efforts and enthusiasm.*

*As we welcome the New Year, let's continue to explore the fascinating world of amateur radio together. May the coming year bring you joy, peace, and countless hours of radio satisfaction!*

*Season's Greetings and a Happy New Year!*

*Warm Regards,*

*Gord Kirk VA7GK*

separ
Surrey Emergency Program Amateur Radio

## *Regional Frequency Plan*

| Name | Frequency | Offset | CTCSS |
|---|---|---|---|
| VE7RSC (Primary Repeater) | 147.360 | +0.600 | 110.9 |
| VE7RSC (Secondary Repeater) | 443.775 | +5.0 | 110.9 |
| VE7RPT (Primary Regional Repeater) | 146.940 | -0.600 | Optional 136.5 Rcve |
| Simplex 1 | (VHF) 146.550 | | |
| Simplex 2 | (VHF) 147.420 | | |
| Simplex 3 | (UHF) 446.550 | | |
| Simplex 4 | (UHF) 447.425 | | |

**Other frequencies in the Greater Vancouver area:**

| | | |
|---|---|---|
| Primary: | Coquitlam/Abbotsford | 146.430 |
| Primary: | Inter-Municipal Group 3 | 146.445 |
| Primary: | Vancouver; Mission; Sec. Coquitlam | 146.460 |
| Primary: | Kent-Mission; Sec. Richmond | 146.475 |
| Primary: | Inter-Municipal Group 2 | 146.490 |
| Primary: | New West; Sec. Richmond | 146.505 |
| National | Calling / FM Simplex Group I | 146.520 |
| Primary: | North Shore; Port Coquitlam | 146.535 |
| Primary: | Bowen Island; Surrey | 146.550 |
| Intermunicipal Group 1 Coordination | | 146.565 |
| Primary: | Lions Bay/Vancouver/Delta/Langley | 146.580 |
| Primary: | Port Moody; Sec: Burnaby | 146.595 |
| Secondary: | Vancouver/Surrey | 147.420 |
| Secondary: | Vancouver (UBC) / Maple Ridge | 147.450 |
| Primary: | White Rock/Chilliwack; Sec. No. Shore | 147.480 |
| Secondary: | Burnaby/Pitt Meadows | 147.510 |
| Primary: | Delta; Sec: Abbottsford | 147.540 |
| Primary: | Hope; Sec: Delta; ALSO EMBC | 147.570 |

# Ham Leftovers...

### The HF 'mini-beam' for small spaces

Years ago, ham radio operators more often than not had land, and usually there weren't any restrictions on what kind of antenna they could erect on that land. These days you are more likely to live with less or no land, and even if you do own property, you might have restrictions that prevent you from putting up any kind of visible antenna.

But even if that's not the case, you might not have room for an old-fashioned "tri-bander" or "cubical quad" that the hams of old preferred. Waters & Stanton has a 65-year-old design for a miniature beam that he explains, and it produces a good beam antenna in a reduced amount of space. You can watch a video about the antenna: https://youtu.be/hmSrTocLqCg

### How to turn a cheap extension cord into the ultimate 10 meter vertical

Recycling unused extension cords for antenna builds. YouTube https://www.youtube.com/watch?v=bL9w_5KwcsQ

### The 2015 K1N DXpedition to Navassa Island

The 2015 K1N DXpedition to Navassa Island was a huge undertaking, and one of the most successful DXpeditions in terms of number of contacts made for what was, at the time, the 'most needed' DX entity behind the unworkable North Korea. Bob Allphin K4UEE was one of the DXpedition organizers, and he has now produced the K1N documentary as his 10th DXpedition DVD.
Watch it on YouTube: https://www.youtube.com/watch?v=Hyx6MZZwc8c

### GNU Radio tutorials for 2023

Tutorial by Daniel Estévez on getting started with GNU Radio Companion, gqrx, and rtl-sdr dongles.: YouTube https://www.youtube.com/watch?v=f2RukR0j4kM

### A Letter

ND7Y scored some permits for a hike up Mount Saint Helens. He brought along N7LFO and N7KOM for a fun time activating. They got 20 QSOs on 2m FM and another 17 QSOs across 20, 30, and 40 meters (CW and SSB). It was a great outing and a first time doing the hike up the Monitor Ridge. The YouTube video is at: https://youtu.be/FcBD3u6CoGs

We're QRT

# Towards a younger demographic

## A call for a change of attitude

by JOHN SCHOUTEN VE7TI

**John Schouten VE7TI** is a Director with Surrey Amateur Radio Communications

Amateur radio, a hobby with a century-old history, embodies the thrill of communicating over the airwaves, the excitement of tinkering with radio technology, and the pride of serving as a lifeline in emergency situations. Yet, as time advances, the demographic landscape of amateur radio enthusiasts is shifting, and the need to attract younger members has become a paramount concern. In Canada, for instance, the average age of amateurs hovers in the mid-to-high fifties, reflecting a concerning trend.

Amateur radio undeniably faces a demographic challenge, with a prevailing perception that its members are aging, and the hobby is growing older. This presents a two-fold issue: not only is the first age category being overlooked by the equipment market, but it also results in an increasingly aged amateur radio population.

The equipment market is driven by profit, and the first age category is being mostly overlooked, resulting in a seriously aged Amateur Radio population. The hobby is not attracting younger people because it is not marketed to them effectively. The current strategy of getting young people to come to “us” is not working out well. Instead, we should help them get started and get out of their way.

Learning environments for exposing young people to amateur radio lie in Maker Spaces and Gamer Groups. One key reason behind the struggle to attract young people is the ineffective marketing of the hobby towards them. The conventional strategy of expecting the youth to come to "us" has shown limited success. Instead, a more proactive approach is necessary. We should help young individuals get started in amateur radio and get out of their way, allowing them to explore the hobby on their own terms.

Creating a welcoming and inclusive environment for younger members is vital. This can be achieved by establishing youth-driven groups

within the amateur radio community. These groups should cater to the unique interests and needs of the youth, providing a space for them to develop their skills, explore their passion, and form connections with like-minded peers. Encouraging collaboration and mentorship between seasoned hams and young enthusiasts can bridge generational gaps and foster a sense of belonging.

Moreover, it's crucial to expose young people to amateur radio in settings where they are already active. Maker Spaces and Gamer Groups offer rich opportunities for youngsters to engage with amateur radio in a natural and engaging way. These environments provide a space for them to learn, experiment, and integrate radio technology into their interests seamlessly. It's a chance to blend traditional radio practices with the innovative spirit of the younger generation.

Here are some steps we could take towards attracting younger members:

- Integration with Technology: Embrace the tech-savvy nature of younger members by integrating modern technologies into the hobby, such as software-defined radios and digital communication methods.
- Education and Outreach: Amateur radio clubs and organizations can host workshops, webinars, and events targeting younger individuals. Demonstrating the fascinating world of radio technology, from digital modes to Morse code, can spark their interest.
- Promote Innovation: Encourage young members to explore new digital modes, develop software, and create applications that enhance the hobby's appeal.
- Community and Emergency Services: Highlight the role of amateur radio in emergency communication and community service. Younger members may be more inclined to join if they see the real-world impact of their hobby.
- Youth-Friendly Policies: Ensure that clubs and organizations have youth-friendly policies, affordable membership options, and support for new operators.

The path to attracting younger people to amateur radio is through a fundamental shift in our approach. We must transition from the expectation that they will come to us, to actively helping them embark on their amateur radio journey and then stepping back to let them explore. By creating a welcoming and inclusive environment that acknowledges their unique needs, we can usher in a new generation of amateur radio enthusiasts who will carry the tradition forward for years to come. It's not about changing the essence of amateur radio but adapting it to fit the evolving interests and preferences of younger members.

My two cents worth, and I welcome your comments. Send them to communicator@ve7sar.net.

See you next issue… I'm QRT.

~ *John VE7TI*

*A makerspace is a collaborative workspace where people can make, learn, explore, and share projects (like the Saturday morning OTC). These spaces can be found in schools, libraries, or separate facilities and can incorporate elements of machine shops, research labs, workshops, and art studios. They are open to people with different experiences and interests who want to build and prototype their ideas.*

*Makerspaces often include high-tech tools like 3D printers, laser cutters, CNC machines, soldering irons but they can also include no-tech tools. These spaces help to prepare those who need critical 21st-century skills in the fields of science, technology, engineering, and math (STEM). They provide hands-on learning, help with critical thinking skills, and even boost self-confidence.*

*Makerspaces are also fostering entrepreneurship and are being utilized as incubators and accelerators for business startups. There have already been some amazing success stories that have come out of makerspaces.*

## SARC SOCIETY DIRECTORS 2023-2024

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president at ve7sar.net

**VICE PRESIDENT**
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vicepresident at ve7sar.net

**SECRETARY / WEBMASTER**
Jeremy Morse VE7TMY
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**TREASURER**
Scott Hawrelak VE7HA
treasurer at ve7sar.net

**DIRECTORS**

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(SEPAR Liaison)
SEPAR @ ve7sar.net

Larry Bloom VE7LXB
New Ham Coordinator
GOTA @ ve7sar.net

John Schouten VE7TI
(SARC Publications/Blog/Social Media & Courses)
communicator at ve7sar.net
course at ve7sar.net

Stan Williams VA7NF

**SARC MEMBERSHIP & CONTEST MANAGER**
John Brodie VA7XB
membership at ve7sar.net

**SARC QSL MANAGER**
(pro tem) John Brodie VA7XB

**SARC REPEATER MANAGER**
Horace Bong VA7XHB
repeater at ve7sar.net

**SARC NET MANAGER**
Reg Natarajan VA7ZEB
net at ve7sar.net

# A look back...

## From The Communicator—November 2013

Past Communicators are available at:
https://ve7sar.blogspot.com/search/label/SARC%20Communicator
or search the complete Communicator contents & index at:
SARCindex

# November and December

This is the final Communicator for 2023 and we hope that you have a great holiday season, hopefully with some ham toys in your stocking.

For our local hams, Les Tocko VA7OM will do a presentation on baluns at our November 8th monthly meeting. Guests are always welcome.

There is no December monthly meeting, but we will have our annual social on Saturday, December 2nd at the OTC.

See you in January!

**SARC** hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228.

On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 or IRLP Node 1737.

*We have a '**Get On The Air**' net directed at new hams on Thursday evenings at 8pm, on our 2m repeaters: North: 147.360MHz+ Tone=110.9Hz and South: 147.360MHz+ Tone=103.5Hz. Our SARC Elmers will be on hand to answer your questions.*

| | SARC Net<br>20:00 Hrs |
|---|---|
| **1st Tuesday**<br>**Standby** | Gary VA7GPR<br>Reg VA7ZEB |
| **2nd Tuesday**<br>**Standby** | Andrew VA7LGN<br>Sheldon VA7XNL |
| **3rd Tuesday**<br>**Standby** | Vacant<br>REG VA7ZEB |
| **4th Tuesday**<br>**Standby** | Kapila VE7KGK<br>John VA7XB |
| **5th Tuesday**<br>**Standby** | Reg VA7ZEB<br>John VE7TI |
| Want a turn at Net Control? Contact the SARC Net Manager | |

## Down The Log…

### SARC Monthly Meetings

2nd Wed. (Sept-Jun)
1900 hrs at the Surrey Fire Service Training Centre, 14923 - 64 Avenue, Surrey, BC. Here is a what3words link and map: https://what3words.com/markers.addiction.ozone

### Weekly SARC Social

Saturday between 0730 and 0930 hrs at the Denny's Restaurant, 6850 King George Blvd., Surrey BC

### Workshops

Saturday between 1000 and Noon at the OTC 5756 142 Street, Surrey

### SEPAR Net

Tuesday at 1930 hrs local on 147.360 MHz (+)
Tone=110.9

### SARC Net

Tuesday at 2000 hrs local on 147.360 MHz (+)
Tone=110.9

### VE7RSC Repeaters

2m North: 147.360MHz+
Tone=110.9Hz
IRLP node 1736
Echolink node 496228

2m South: 147.360MHz+
Tone=103.5Hz Fusion capable; No IRLP/EchoLink

1.2m: 223.960 Mhz -1.6
Tone=110.9Hz

70cm: 443.775MHz+
Tone= 110.9Hz
IRLP node 1737
WiRES-X Room ID 00047

## We Have A SARC Patch!

These are suitable for sewing on a jacket, cap or your jammies, so you can proudly display your support for the club.

The price is $4 each or three for $10 and they can be picked up at a meeting or the weekly Koffee


Burnaby Radio Communications

Michael J. Wong VE7HMW
President/Owner

4257 Hastings Street
Burnaby, B.C.V5C 2J5
Phone 604-298-5444
Fax 604-298-5455

Commercial / Amateur Radio

Email: sales@burnabyradio.com
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